# dataweek

Vol 10 No 13 Mar 25 1970

Lillian Malt talks to 'Dataweek'

# Keyboards and training

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# L Plates for Keyboard Drivers

We are going to need 143,000 new people for data preparation over the next five years, says the latest NCC Newsletter. The NCC's purpose in publishing the best data available is certainly far-sighted and sensible—to invite comment at the earliest possible moment.

In a technology that moves at jet-set speed, it's seldom possible to know what will happen next year, much less next decade, but you still need to do long-range planning.

It's as if people were trying to predict the growth of the automobile industry in 1910, without being able to consider the phenomena of motorways, suburbs, a 'leisure industry', or pollution problems attributed to cars, simply working instead from the 1906–1909 automobile sales figures.

Doubtless some optimists saw a need for 23,500 chauffeurs and 42,000 skilled mechanics by 1920—and perhaps they set up training schools to hold some tiny part of them.

Today's emphasis on data prep is partly the result of some canny detective work on the part of a few people who found a very lucrative chink in the IBM market and used new kinds of equipment to plug the gaps. Presto, a new subculture within the industry.

Very few people have yet begun to invest in the business of training the people to run the new machines, although users and manufacturers are beginning to concentrate on this area. In this issue we talk to some of the rare independent training experts, and explore different philosophies of keyboard training that may affect input.

While they debate the details, we begin to see a familiar theme—the need for standards of performance and a means of reputable certification for data preparation people as well as programmers and analysts, for the protection of unwary students as well as future employers. NFS


**dataweek**

The news review of data processing

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# OUTLOOK

## Training Executives

As we enter the Information Age we concern ourselves with the equipment the successful business will have to have to be competitive. But it will take people to make best use of the information the equipment will be able to gather and analyse so rapidly. What sort of training will the executive in charge need to direct such operations?

He could well be a graduate of a programme such as that now being run by the Georgia Institute of Technology, at present pioneering a new area of study—information sciences. At present Georgia Tech's School of Information Sciences is offering graduate studies in the subject, but it intends to start an undergraduate programme this year. Graduates will not be computer programmers in the popular sense of this term. Although the curriculum provides an impressive amount of technical knowledge, the school expects their training to equip them to be the computer executives of the future.

They study an impressive variety of courses in one of three areas. The first is theoretically oriented, at a fairly deep level, examining the properties, structure, and behaviour of information. The second emphasises the design of advanced information systems, such as corporate information systems. The final curriculum emphasises the engineering design of computer systems and utilities.

Georgia Tech's catalogue for the School of Information Sciences contains nearly 50 courses in areas such as theory of information communication and control; descriptive and mathematical linguistics; engineering analysis, design and management of information and computer systems; theory and techniques of information processes; applied mathematics; theory of programming; and such abstract areas as mathematical logic, semiotics, philosophy of mind, cybernetics, artificial intelligence, and automata theory. A formidable array, on how to handle the information, not too much emphasis on what to do with it.

## Gemini Genius

Gemini hove into sight in the UK when Urwick Orr and John Diebold parted company. Part of this deal was that Urwick Orr should have a share in a European software house by the name of Gemini.

Not so long after this Gemini put out a fairly modest press release announcing that they had a 40 per cent share in a Dutch software house, Pandata NV. "This," said Marc Charguéraud, president of Gemini Computer Systems, "is the fourth company in Europe that Gemini Computer Systems Inc started within the past 12 months." One of these is in Germany—Gemini GmbH—there's a certain amount of discretion over the other two, "one's in France" and "one we've had for a year."

All this is history, even if only partially disclosed, but it is possible that the biggest bit of the iceberg is still concealed. It is rumoured that Gemini could be making another form of tie-up in the States with one of the most reputable software names there.

Just exactly what this will be is a pretty closely guarded secret, but there are plenty of precedents. It could be something like P-E Consulting Group's one year 'franchise' link with Informatics for a specific software product, or it could be a closer liaison.

It is generally known that many upstanding US firms are now looking across the Atlantic for expansion while the US money market readjusts itself.

Whatever it is, Gemini can be expected to carry off the new liaison quietly and competently.

## This week in Dataweek

☐ Our weekly sports report gives way to more productive testimony as Subcommittee D meets some users for the first time (page 5).

☐ Gail Purvis went out to interview an interesting lady in a pink hat, and got involved in a keyboard project that simply grew like Topsy. She was last seen tracking down still another finger-dexterity philosophy (pages 6–10 et al).

☐ Next week: a leisurely look at IBM on April Fool's Day 1970.

# Expensive training

**CAP just finished a training session for top-level executives that underscores the value—and cost of management training in the computer industry.**

Because every CAP executive is a 'working man', the 46 men who gathered for two 14-hour days of intensive training represent 1,288 man hours. If you assume a couple of miscreants had a pint somewhere, you could cut it to 1,250, but even at a super-conservative consulting rate of £10 per hour, this represents £12,500 in potential earnings the company preferred to invest in training.

## Highly fashionable

**IBM's third education centre—the first two being located in Japan and Mexico—is the Nordic Education Centre located at Elfviksudde, near Stockholm.**

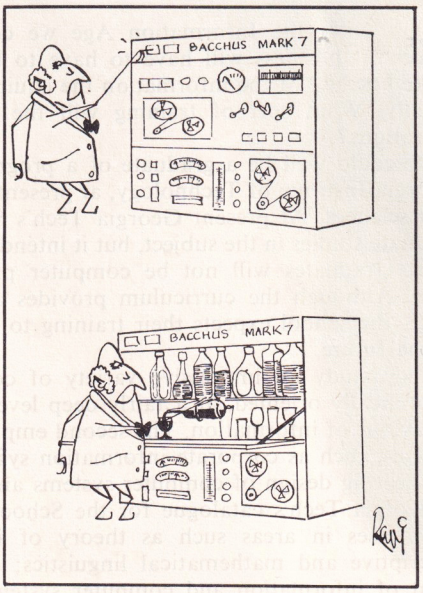
"The aim of both the IBM development program and the architectural team was to create a highly functional education centre matched with a friendly congenial atmosphere."

Curiously enough function appears to win out over friendly. On the ground floor, near the printing shop, the bath, and the sauna is the bomb shelter! This occupies 16,000 sq ft. Even the hotel, with 60 rooms, only takes 12,000 sq ft!

## Test yourself

**The keyboarding flavour in this issue spilled over into the *Dataweek* office, of self-typing journalists.**

The final tally reveals two touch typists, several of the normal two fingered hunt-and-peck variety, and one seven-finger speed demon.




## Not so featherweight

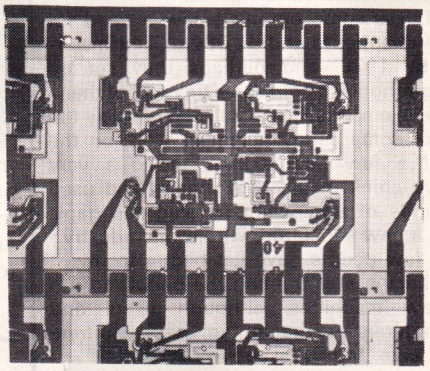
**"Well, I think it's more of a gimmick really, dear," said the obliging lady on the Slumberdown stand at the Ideal Home Exhibition. She was referring to the Burroughs L2000 standing quietly amongst the display of continental quilts.**

After a little confusion about switching on the machine, the L2000 politely trotted out a welcome, asked about five questions concerning the size of the bed (single, double or king), length of the occupant and whether the bedroom was centrally heated. Once answered, the L2000 then coughed up the ideal Slumberdown choice, giving size and price. The latter varies on the choice between down or feather and down.

One suspects that the audience is more fascinated by the model on the stand comfortably ensconsed in a deep freeze along with two chunks of ice!

## Isylithic nonsense

**The Isylithic beamlead device is made in a process similar to the process for ordinary integrated circuits except that the buried layer and isolation diffusion steps are eliminated. After the diffusion processes have been completed, a thin-film metallisation pattern is deposited**



**and heavy gold beamleads are electroplated on top of the metallisation. Chief advantages of the beamlead are visibility of bonds for inspection; reliability of the metallurgy; and the possibility for low-cost assembly. The Isylithic beamlead process is still in development at Sylvania International but devices are already produced for use at microwave frequencies.**

## Everton v Liverpool — — no competition for IBM Data Centre

**Little do the football fans of local arch-opponents Everton and Liverpool know that they have a common cause for once; both can be grateful for computers. Courtesy of IBM Data Centre, they will soon have a better chance to see their home team.**

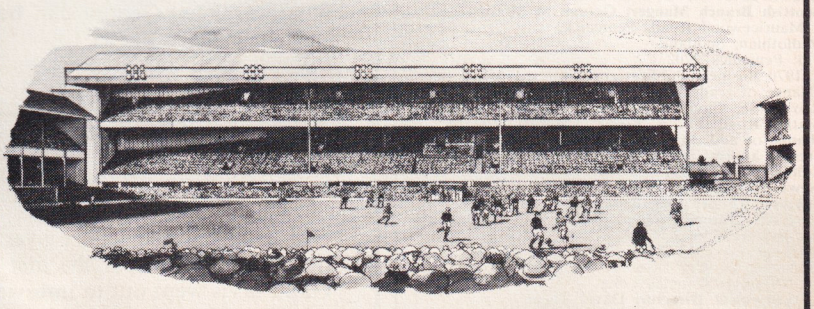
The IBM Data Centre 360s in Liverpool and Newman Street, Central London, are being used by consulting engineers, Bingham Blades, who are designing new stands for the two clubs. The work involved the use of IBM's STRESS package for analysis of the design.

Everton's stand, with its capacity of over 11,000 fans, will be ready for next season. The stand presented problems in design, since existing conditions gave no room to expand in any direction.

In the case of Liverpool FC, there was more room.

The consultants are now considering the installation of an IBM 1130 computer of their own, which would be partly used as a terminal to Call 360. As for football, they refused to make a stand for either of the clubs. Understandable.

*This is how the fans of the Everton football club had to fend for themselves in the past.*



*. . . and this is what the completed new stand will look like in the nex season. Without the IBM Data Centre they would have had to wait.*

# Big users have their say

**Chemical—or steel—export figures are clearly more important to ICI—or BSC—than computer exports. Users say the Government should invest in reliable software—and more of it.**

Last week's Subcommittee D investigation was a double bill, which turned out to be a morning of constructive communication as top management from the British Steel Corporation and ICI filled out the industry picture with the computer users' view.

Both four-man teams turned in impressive performances. Subcommittee chairman Airy Neave commended them especially for their 'meaty' written evidence, which backed up opinion with fact.

In a hard-talking, two-hour session the committee ranged widely over users' requirements (and why both seem to favour IBM), education and training of staff, the future of the industry and how the Government can help. But by the end of the session, the answer to the question what is or ought to be the Government's part in the computer industry, remained elusive.

## British Steel testimony

For N C Pollock, director of management services for BSC, the role of the Government was to keep the computer industry as competitive as possible.

"Sometimes I don't think the industry is as competitive as it could be," he said. "I don't know how it can be made more so. Software is one area where more support might be given."

"If IBM unbundle along the lines most people think, there'll be a move to set up more software houses. Of course, the weak will go to the wall.

"But the Government can make a good investment here," he added.

BSC's decentralised approach with considerable autonomy in equipment choice from one division to another and a stress on smaller machines contrasted sharply with ICI's medium-sized machines, sophisticated management sciences applications, and inter-division network plans.

Advice for the Government from J K Stewart, director of the management services division of ICI was to concentrate attention increasingly on the growing importance of software.

"There is a large body of skill in the Universities that might be exploited more," he recommended.

One of ICI's key recommendations was that the Government should give far more attention to the relationship between software and management, and the management changes necessary to use computers fully.

Both companies suggested that the Universities can help in this area. At present there is no formal feedback to industry on software being developed in Government departments.

On the future of the industry, Mr Stewart said no manufacturer can manufacture everything superlatively. "If a company is very large they'll have soft spots which smaller companies can exploit," he said.

During the examination, ICI, though its equipment spectrum is largely IBM-dominated, denied there was a policy to purchase IBM equipment. Of 28 business-oriented computers, 19 were IBM, but of 20 process computers 16 were British.

Although MP Eric Moonman suggested that ICI might have a "subconscious approach to buying IBM," Stewart pointed out that English Electric and ICI were advised of five-year requirements several years ago and were given ample opportunity to tender whenever dedicated or one-off systems were ordered.

Mr Stewart said there were considerable costs involved in changing from one manufacturer to another. The company had invested 2,000 man years in software currently running on its machines. Thus reprogramming costs simply prohibit changeover to any equipments which are not absolutely compatible with these computers.

How can ICL succeed? "To sustain its growth it must have a high quality product backed with good software," said Mr Stewart.

"There is a big demand for equipment within ICL's planning horizons. The real issue is that their present competitive position needs strengthening.

"Technical excellence and an understanding of the customer's problems are key requirements. The software must work extremely well," he said forcefully.

ICI sees a strong need for high-quality education. On-the-job training is as important as theoretical training.

Said Mr Stewart: "The Government could perhaps concentrate on training people. This is quite the most critical area. You can't use computers unless you get the right people.

The well-considered evidence from ICI underlined the purpose of the subcommittee—to fill out the picture of Government-industry interaction.

The representatives of BSC—a nationalised industry—were rather more cautious than ICI, but still made a number of telling observations.

BSC's Pollock criticised British computer companies for being less reliable with service than their foreign competitors. But when pressed by Eric Moonman he insisted that this criticism was not directed solely at ICL.

Specifically, however, he did openly criticise ICL's policy of insisting that magnetic tapes and disks used on its machines must come from approved suppliers.

"ICL will not guarantee to maintain your computer up to a required standard if you use non-approved equipment. There's supposed to be a list of approved manufacturers, but we have not succeeded in seeing a copy of it. IBM don't object, on the other hand, if we buy our tapes or disks from other suppliers," he added.

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# The keyboard training controversy

'Keystrokes' don't mean much to most people, but if one remembers that there are six strokes per word in English, then Lillian Malt's training system, which helps operators reach speeds of 100 words per minute, looks pretty impressive.

As the world's computer population increases, the world of keyboard operations explodes. The typewriter kingdom has always been large, but from an investment point of view the keyboards linked to computers must be worth millions. What sort of training facilities exist for the use of all this equipment ?

Undoubtedly the Rolls-Royce of keyboard training is the Malt-Pitman method ; this in turn is based on " skills analysis." Briefly defined, " skills analysis " is the analysis of a particular skill, the analysis of the human, and the marrying of the two in a particular training method. One of the originators of " skills analysis " is Douglas Seymour. His work influenced Lillian Malt.

Lillian Malt in turn has concentrated on " skills analysis " as applied to keyboarding. The result: " we have been able to train ten per cent of operators to set at 30–36,000 keystrokes per hour. We believe that within the vast keyboarding population there must be many thousands of operators who have the capacity to attain this speed, and doubtless many tens of thousands who can be retrained to increase their speed to 24,000. These could probably have been trained to 30,000–36,000 keystrokes per hour, if the analytical method had been used for their initial training."

## Typesetting Origins

To date the analytical method has been mainly applied in the printing industry for typesetting. The advent of computer typesetting has in many cases necessitated the retraining of linotype operators. From the American viewpoint the investment in computer equipment has been such that management has appreciated the need for specialised training for operators. Printers in the UK have been slower to appreciate this.

First off the mark in the UK were Thompson's at Reading, followed by IPC at Southwark Offset and recently the *Glasgow Herald*. One of the problems here is that the rate of output in printing is not constantly measured. " In many cases," says Lillian Malt, " it is probably around 3,000 keystrokes per day, which is abysmal—and this may be with a four to six per cent error rate."

" If you look at the highest-speed operators you find that what they are doing is reading ahead of the setting material, setting arithmetically and setting without understanding what they are setting."

## Long-fingered operators

Lillian Malt points out some fascinating thoughts on the keyboard operation. " Long-fingered operators will make errors which are different from operators who have short fingers. Right from the beginning they can be taught to hold their wrists differently to avoid these errors. A consistent error on the letter " n " was traced to an unbalanced shoulder position. The relative length of arms to torso, and even of shoulder to elbow and elbow to wrist will affect operator performance, and, if not taken into consideration early in the training will induce errors only eliminated by months of patient effort.

The skills analysis course uses a manual of exercises. Work done during training is analysed daily by the supervisor, the sources of errors are analysed and remedial exercises done the next day.

The training method has a number of interesting effects: it reinforces reach and stretch movements ; it balances the ineptness of the left hand with the dexterity of the right hand ; it avoids neural response confusion (for example, setting " e " for " i " and vice versa can be traced to confusion in neural responses) ; it breaks from the rhythmic letter-for-letter reading and setting useful in the early stages, but inhibiting for speed ; it teaches word reading in syllables for long and unfamiliar words ; and it corrects errors quickly.

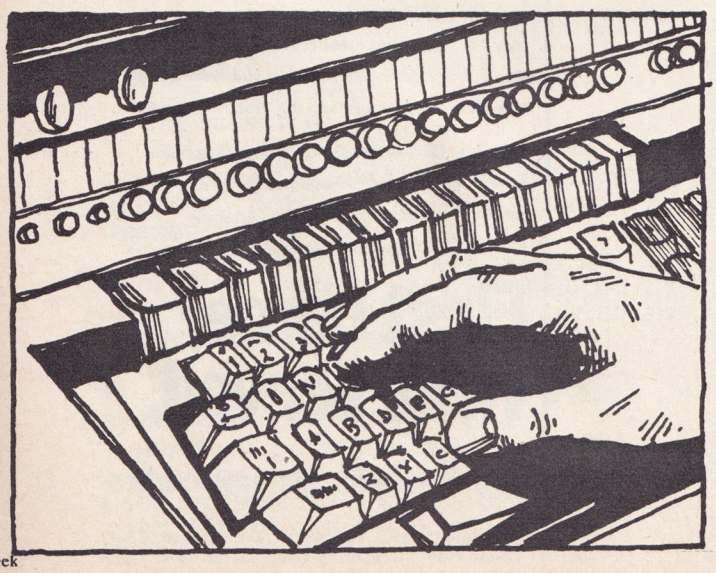
Interestingly enough, as error awareness leads to reinforcement of errors, operators are not told what errors they are making but are given corrective drills to remedy the fault.

There are three stages of training in the Malt-Pitman method. Beginners go through a 60-hour course, 3 hours daily, 15 hours a week for four weeks. The cost of this is approximately £100. The intermediate stage can take place three months after the first course, takes 30 hours and costs £60. Three months after this comes the advanced course, a further 30 hours and a further £60. This boils down to eight weeks' training over some seven months at a cost of £220, although costs are linked to the size of the class group which usually does not exceed 10. Experienced operators will need only the intermediate and advanced courses.

## The move into data processing

In the printing industry at least this cost probably approximates to some 5 to 10 per cent of the investment required for equipment. From the American point of view this expenditure is valid. From the UK point of view training is seldom considered this way, with a few exceptions. User comments are interesting. A Linotype operator felt that " while I was always considered quite swift as a Linotype operator, I was never confident that I could reach the same degree of efficiency as a perforator operator. Now I am confident that I can attain the same degree of efficiency with less strain and monotony."

One operator who has used Fairchild TTS machines and then worked on IBM 72 with Lumitype, who was retrained over a period of three weeks, commented: " I used to feel as though I had been heaving paving stones after a day's work; now I do much more in a day and I get home fresh and not a bit tired."



July of this year, however, sees a revolution. So far the skills analysis method has only been franchised through Malt-Pitman for the printing field. After mid-70 the franchise will also be extended to the data processing fields, which may be made rapidly aware of cost-effectiveness factors.

It's a system that is unlikely to burst upon the field. It is not exactly cheap, although training for data processing will be less expensive because it will be shorter. It is a training method probably more justified for expensive equipment, and in the printing field in the UK it has been somewhat discouraged, partly because of union attitudes and partly because management has not seen the need to train an "elite" in keyboard operators.

In the States, the system has become famous as the Lillian Malt system. From 1970 the US franchise will be held by Management Concepts Inc, chosen jointly by Lillian Malt and Pitman's out of three contenders because they are in the mainstream of business data processing.

## The Mother of Keyboarding

So who and what is Lillian Malt? A small, well-groomed, intelligent woman who was born and educated in South Africa, where she took a commercial teacher's degree and taught. In 1954 she came to the UK and was engaged in "skills analysis" in industrial operations with a firm of consultants.

After this, she worked independently on staff development and training systems. Having trained *Reading Evening Standard* for Thompson's and Southwark Press for IPC, she was approached by Pitman's, who arranged to help promote the system in return for copyright of the manual and a franchise in the system.

Lillian Malt's work is not solely concerned with keyboard operations—about one-third of her time has been spent in industries as varied as electrical and electronic manufacture, knitting mills, and shoe manufacture. She is probably best known, however, in printing circles.

One of her more interesting theories is that "keyboard-wise," the standard alphanumeric board is not geared for high speeds. At present this forces operators to deal with the greater work-load on the left hand (8 per cent of the population is left-handed)—some 15 of the 26 letters of the alphabet are struck with the left hand, and only 11 with the right hand!

On electric or manual keyboards perhaps this arrangement does not too greatly affect speeds because the keyboards are slow—and vested interests are sufficient to rule against any major changes. But when it comes to electronic equipment, better layout is essential to maximise on output. Lillian Malt has convinced three manufacturers that they should manufacture keyboards to a "skills analysis" layout. It will be interesting to see the effect of her new key arrangements on input industry productivity.

GAIL PURVIS

# The Pitman outlook on keyboarding

Ian McLeish, group development manager of Sir Isaac Pitman & Sons Ltd, explains that by the end of the 1950s and in the first few years of the 1960s, State provision was reducing the number of students in Pitman secretarial colleges. On the publishing side however (around 10th largest book publishers in the UK) Pitman's was growing.

To use the expertise in hand the colleges profitably, Pitman's was investigating the training of computer programmers, since there seemed to be a demand for such training 'with integrity.' But the capital investment required did not make this a good proposition. The industry changed so quickly and enormously that the syllabus would probably have to change frequently and there wasn't a tangible potential market.

By 1967 perforator keyboarding was an obvious choice. Pitman's research with the Federation of Master Printers, with Unions, with keyboard manufacturers and others kept pushing forward the name of Lillian Malt. Pitman's decided to evaluate two systems, Lillian Malt's and one other.

The evaluation was conducted by Pitman's own keyboard and printing people. The evaluation was objective and included extensive classroom validation. The other method had value in the first few hours of training, but the instruction people strongly disapproved of the software method thereafter. It was later discovered that the Lillian Malt system could be used to do remedial work on other training systems. The most difficult thing in this type of training is to repair the ruptured ego of the operator who in an earlier training encounter has acquired inbuilt faults and low speeds on any work that is non-repetitive.

The alternative method was rejected. Lillian Malt's system however had something substantial to contribute to keyboard training. Curiously enough, best sellers on the Pitman list are Douglas Seymour's book on training, so they had an additional yardstick to go by.

Having looked at the case of Thompson and Southwark Offset, Pitman considered the Malt system worth pursuing. In the summer of 1967 they came to an arrangement whereby they promoted the system in return for copyright in the manual and a franchise in the system.

## Management attitudes

In this country they find the system has sold slowly. It may be partly union attitudes, but it is largely management attitude. "More managers in the States," says Ian McLeish "are prepared to do basic sums, linking investment in capital equipment with investment in training.

From Pitman's point of view two years of operation shows a break—even by March of this year; 1970–71 will put the system in profit. Initially Pitman started by setting up a centre; however, the economics were ridiculous so it was changed to training done in-house with the company concerned. Groups of companies now use the system with the largest company acting as host to the training. Apparently at the *Glasgow Herald* a couple of places there are being taken by non-*Glasgow Herald* trainees.

But in all this the method of training requires good-quality instructors. "The biggest single limiting factor in expanding the scope of our services," says Ian McLeish, "is that in 18 months of training instructors two-thirds have fallen by the wayside. Somehow it is impossible to screen prospective teachers sufficiently and they seem to fall down on undetectable things."

"It's the application of the amoeba principle—spreading the net through a further franchise system, overseas, which gets more instructors and overcomes the tough law of averages on successful teaching."

## DP Franchises

How much difference to the Pitman market will the expansion of the franchise to the data processing field make? "Well, we have to face two broad categories of potential customers. The second don't care to quantify or qualify the degree of training efficiencies."

Probably one case in point is the bank that couldn't be persuaded that depth training was worthwhile. They preferred to use the ordinary typewriting instructor to train their staff. Its a saving of sorts. By the typewriter method the cost for some 11 or 12 operators will be some £600 compared with the Malt-Pitman method which would cost about £2,400. And most employers are anxious about losing highly trained staff (hence the training boards.)

Pitman is lucky. It spreads a net which catches most of the market from the superlatively efficient training to a lower end which will simply get a level of efficiency.

"We offer a training service where there's no strong tradition of training and there is quite an educational marketing job to be done—with managements!" GAIL PURVIS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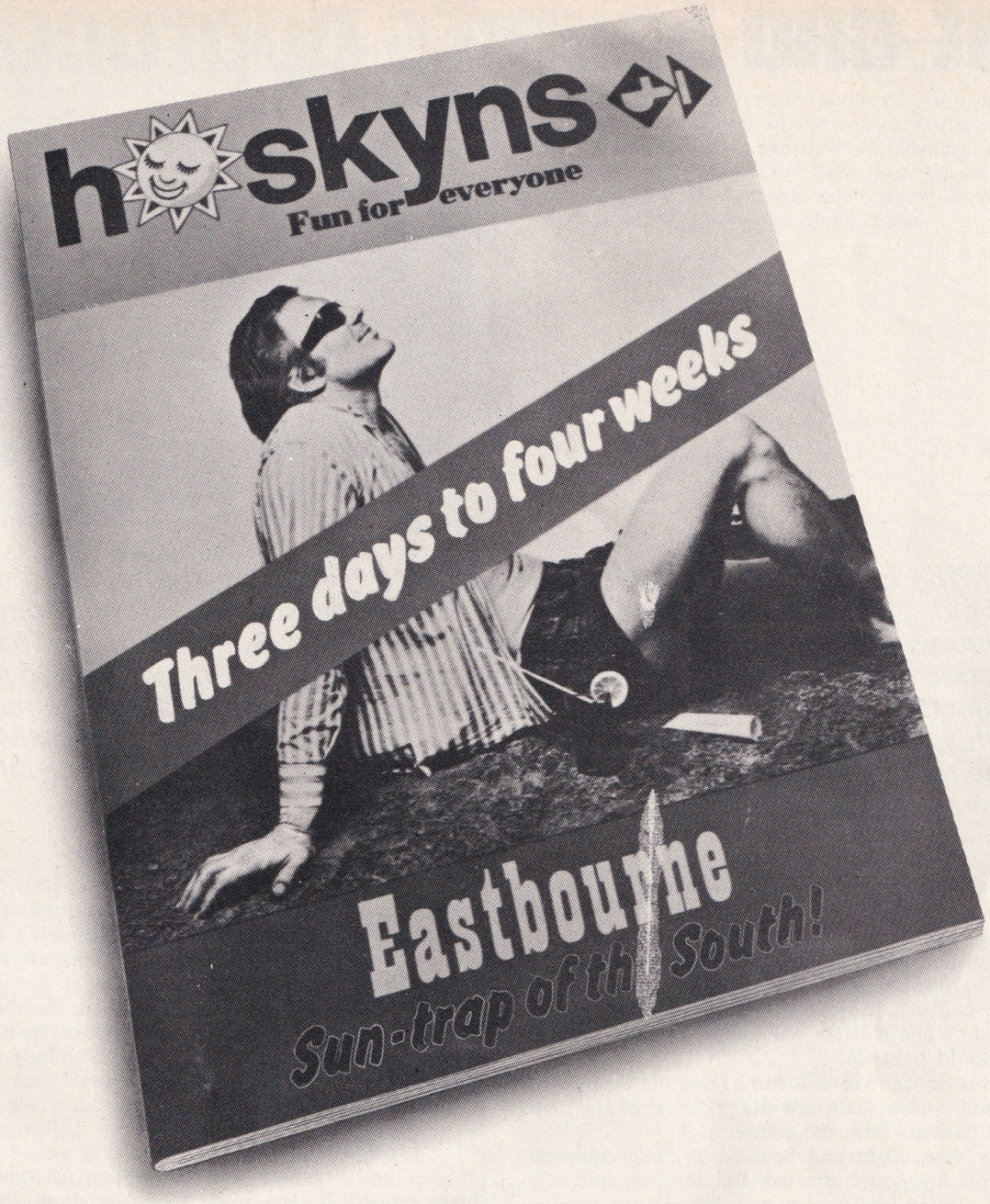


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And should anyone think that he'll be wasting his time before he goes, packing his swimming trunks and suntan lotion, perhaps he should know that there's a pretty comprehensive application form to be filled in. To make sure that he's in a class with others of the same experience.

On the other hand, the picture isn't entirely black.

If he thinks we've been unduly hard on him, he can say so in the report we ask him to make out on us, our lecturers and our courses.

And any spare time he gets he can spend chatting computers with old friends. Over 60% of companies who've sent staff on any of our courses send others back for more.

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# Sight and Sound's approach

*The NCC in the current issue of its newsletter has a feature on future staff needs in the computer field. Using figures from "various acceptable sources" John Humphries has compiled figures that he advances tentatively for comment. Relevant to keyboard training is the projection for extra computer operators over the next five years—estimated at 48,200—and the projection for data preparation people—an estimate of 143,800 to be required. Figures of this magnitude bring home very forcibly that one company such as Malt-Pitman cannot hope to train the required people. Sight and Sound in London has developed quite a different way to train people to use keyboards.*

" In the UK last year, we trained some 40,000 people in keyboarding," says a spokesman for Sight and Sound. " Perhaps 12 per cent of that was for computer work."

James Park, who founded Sight and Sound five years ago, first got interested when he tried to learn keyboarding and was dismayed at the difficulty it presented. He then devised a large display keyboard. When a letter was called out, the letter on the keyboard would light up.

Park offered this device to several companies, but they showed little interest, until Andre Sbath saw the potential of the invention and joined Park to form the company.

Since its early days, Sight and Sound's teaching equipment has become increasingly sophisticated. But the principle is the same. The large display keyboard is now linked to tape equipment which calls out the letter to be typed as the same letter simultaneously lights up in the display keyboard.

The company operates through a series of franchises. The system is now being used by the States, South Africa, Australia, Ghana, Israel, Austria, Belgium, France, Italy, West Germany and Switzerland. This year it will be exported to Spain, Sweden, Portugal, Zambia, Tanzania and Japan. Each foreign country requires that the software (tape) and hardware (display keyboard) be adapted.

**The same letter simultaneously lights up in the display keyboard.**

The pattern of franchise can vary. In Zambia for example, Sight and Sound is under the auspices of the Commission for Technical Education and Training. In Italy, the system is handled by two commercial companies.

## The Rhythm Method

Sight and Sound is less demanding on time, and perhaps better suited to the average pocket than the Malt-Pitman method. There are three courses: basic, intermediate and speed. Each consists of 12 hours of instruction, one hour a day, on consecutive days and costs 14 guineas per course.

The basic course takes a student with no experience of the keyboard up to about 15 or 20 words per minute. Apparently about 90 per cent of the students reach 30 to 40 words per minute in the intermediate course, and 50 to 60 words per minute in the speed course. Perhaps 30 per cent get higher speeds, about eight to ten per cent taper off a little lower.

As the student walks nervously in to the first lesson at Sight and Sound, a taped voice welcomes the class. Then it teaches the basics of the keyboard operation, how to sit, how to hold the wrists, and where the basic keys are located. The keyboard is blank except for the asdf jkl; keys, which are marked in yellow.

The first lesson covers the whole of the alpha keyboard. The second hour goes through the alphabet with paper in the machine. The third hour consolidates this, and by the fourth hour the display board above the display keyboard is being used, although the light is still being displayed

At this point in the basic class, the taped voice calls out a letter which is not printed on the board. The class simply breaks down under the disparity between audio and visual inputs. " Its rare to have a program teaching by error " say Sight and Sound, " but in this case it makes the typist think."

After the basic course the trainees begin to work at their own pace—the tape has eight tracks, which accommodates most speed requirements. The displayed keyboard is no longer necessary, and students work from printed material which incorporates finger exercises, words, sentences and paragraphs.

Students reach 50 to 60 words per minute in the speed course.

## Pavlov robots

It is almost alarming to walk into the Sight and Sound centre at Oxford Circus. There is something Pavlovian about the robot-like people, eyes glued front, fingers rhythmically tapping out letters as these are called out by an unvarying voice.

But Sight and Sound point out that this is not brain-washing. The system is building in a conditioned reflex; nothing is being wiped out, merely put in.

Class sizes vary. They can accommodate as many as 35 people but this of course depends on supervisors who periodically enter the tape-controlled rooms to check on progress and remedy errors that may creep in. Probably the most varied aspect is the faces. These people come from all professions, represent all ages and backgrounds, from air-chief marshals to postmen.

Users vary also. ICL uses the system in its own Customer Training Centre but IBM opinions that "keyboard training is adequately catered for outside IBM."

The Midland Bank has installed its own Sight and Sound equipment; several newspaper organisations not only use the system for internal training but have also opened centres to provide a training facility within their respective areas.

"We retrain printers," says Sight and Sound "to a 50 or 60 word per minute speed with accuracy on a 95 per cent base. Both factors are important, as bonuses for keyboarding are based on both speed and accuracy."

Some companies require specialised systems; Sight and Sound is willing to produce them. Eight people in the company's R & D division in Berkshire are responsible for developing the basic tapes. At present the company is also reprogramming the tape-playing machine for the Navy.

The company does not offer any sort of certification. "We will report back to companies on their staff or give a letter stating what course was taken and the achievement, but we're not an examination board."

So far three industrial training boards have accepted Sight and Sound for grant purposes, these are Printing, Hotel and Catering, and Construction. "One of our lessees applied for installation cost of the equipment and got a grant on that."

The "drop out rate from our classes? About 49 out of some 5,080, mostly from illness. The two classes of people most difficult to teach are journalists and the undermotivated girl from a good middle class family who has been sent to learn keyboarding in furtherance of her secretarial career."

GAIL PURVIS

*The computer programmer is one of many people met by the Excise Officer in the course of his work, and here described after the style of Chaucer, himself a Collector of Customs. The verse first appeared in The Journal of H.M. Customs & Excise. It is reproduced here with the permission of the Editor.*

# *The Computer Programere*

Whan traidres can not cope with their afaires
som see the answere to destracted preyers
in a computre's trompeted precisioun,
and greet celeritie of composicioun.
In trouthe, whan prikklie problems press arond them,
computres may serve onlie to confond them,
but wher computres governe everich thing,
amonges the staf the programere is king.
And oon swich king I hadde uponne my Ryde
that used to be my solitarie gyde
thru alle the trakkes of his owne straunge contree
of alpha and numerik binarie.

His Companye sente forth bukes of alle sortes
thurghout the lande, and eek to foregn portes,
but journel or sales daye buke they hadde non,
insted, computre prynt-outs by the tonne.
And he wolde helpe me oer these papre dunes,
sith, like a dragoman, he wist the runes:
Fortran and Cobol he graspt at a luke,
and papre taipe he coude rede like a buke;
octal he knew, prime data coude define—
he was in alle respectes a man on lyne.

He smokt a pype, and quietlie puffed at it
the whyles he spake of caractre and bit,
magnetik diskes, and all the trials he suffred
that his computre was nat fuly buffred.
Natheles he was of his machene most proude,
and sceptik gibes he sternlie disalowed;
if I implyd som detayle porelie rekkoned
he wolde disclame it in a microsecond,
and, thumming his ponched cards, he wolde assure
the data was alle in the backing stor,
and som test program wolde anon devize
to prove it, with prodigious entreprize.
Computres coude in ne wyse err, quod he,
mistakes deryved but fro humanitie.

In his professioun nedes must shote this lyne,
but ay he kept a twinkel in his eyen,
and spak nat like som stoffed sherte fro greet height,
but was alwey a merie-humored wight.
Long houres aloon I spent on visites ther,
but export rebate was my onlie care,
so now I see the programere ne more,
ne stryve to folow his computre lore.

HOWARD

# IBM teaches people to speak proper "WORDS, WORDS, WORDS"

Being an international company poses its own special problems, as IBM often finds out. One of the strengths of the international aspect of a company is that it can draw from its combined talent wherever it may be located. This must be balanced against the need for standardisation of many procedures, as well as the more evident need for standardisation of components.

The most obvious of the procedures which must be standardised is the use of a common language, which one would expect to be English in the case of IBM. Naturally it *is* English, but this is not enough in itself.

Japanese English tends to vary from German English. Therefore the high-powered educationalists of IBM have decreed that there shall be an IBM English in addition to the Queen's version.

Accordingly they have established English teaching programmes in several countries around the world. The latest of these to commence operations is the Intensive English Unit at IBM's Sudbury Education Centre. The aim of these programmes is threefold: first, to enable better comprehension of training manuals; second, to allow better communication between customer engineers and field managers and their clients; finally, to enable full appreciation of operating instructions to world-wide terminals from the company's control computer in Havant.

The siting of this particular Intensive English Unit was made for the self-evident reason that the language is best taught to foreign nationals in its own environment. Students are accordingly farmed out to local landladies for the normal two-week period of the course, and kept separated from their fellow nationals. Because of the requirements for highly-skilled teachers of English in addition to the very sophisticated teaching aids available, the contract was handed to the International Language Centre of International House, which has a reputation for doing this kind of work. ILC is a strong rival to the more famous Berlitz school of languages. An indication of its present standing is that it has been awarded the contract for teaching English to all officials of Expo 70 in Tokyo.

ILC believes very strongly in environmental teaching, and the use of as many aids as possible. This particular course for IBM has a non-technical bias, despite its specific nature, composed entirely as it is of computer men. The teaching staff have found that the students are often capable of reading complicated technical pieces in English but unable to speak a word; therefore technical competence is not a primary consideration. In addition post-course assessments have shown that the majority of students are, dare it be said, sick of computers, and glad to do a course in something different for a change.

There are two entry levels to the course, one elementary, assuming only a familiarity with the alphabet, and one intermediate, where some knowledge of the language is assumed. The attendance is arduous, nine hours a day, six days a week, for two weeks. The teaching staff operates in two shifts, morning and evening.

All teachers at the 'IBM English' school have experience in teaching English as a foreign language; the course director Barry Tomalin, has taught in Algeria and West Africa; another of the staff has taught for foreign language; the course driector, Barry the British Council in Mexico and Kenya; and another, John Hunt, has done a range of activities from bricklaying to acting, before he took up teaching.

Doubtless Dr Johnson would have scathed. Not so much at a very competently produced dictionary, rather more at the verbosity of the computer language. In the Penguin 'Dictionary of Computers' even the most gifted serendipidist is going to run foul of things like 'interface channel—see interface' and 'interblock gap—also known as interblock space.'

Peace Dr Johnson. If you lived in a world where computer terminology seems to be a deliberate baffle for the non-technologist and even for the specialist this sort of dictionary is a godsend.

As the authors say in the preface: "Each of us, whether layman, computer user or computer technician, will have problems with computer terminology from time to time, and it is the purpose of this book to provide a ready means of solving these problems.

"Since the early 1950s, when computers first began to be used commercially, many hundreds of everyday words have been given new meanings and words which had a peaceful existence on their own in ordinary English dictionaries have been joined together in the computer world to make phrases which are quite unintelligible to anyone unaware of their specialist meanings or new nuances."

Take courage, between 'aberration—a defect in the electronic lens system of a cathode ray tube' and 'zone punch—synonymous with zone digit' there are the more choice and esoteric phrases such as 'cripple leap-frog test' and 'graceful degradation' and 'ping-pong.'

Furthermore, the computer enthusiast will be delighted with the acknowledgement thanking "ICL for making time available on one of their 1900 series computers so that many of the tasks of putting this book together were accomplished efficiently with minimum effort."

Resign yourself to parting with a seven-sided coin—it's worth it.

## Burroughs enters superfast output league

*Burroughs microfilm output system—forty times faster than a line printer.*

Although 96,000 characters per second is somewhat faster than most people can read, and a mere 40 times faster than the average line printer, these are the speeds of the microfilm output business.

The latest contender in the field of superfast production is Burroughs, with its BCOM system. BCOM units, which were developed in the US, are now beginning to arrive in this country.

Microfilm systems have several advantages over conventional forms of computer output in terms of speed, compact storage, and ease of retrieval.

A 4-inch square cassette of microfilm can store data equivalent to more than 2,000 pages of ledger information.

Retrieval is rendered extremely simple, says Burroughs, by using one of several variations. The company claims that any document can be found in a standard 100 ft roll of film within 15 seconds. Information from the frames is displayed on a large screen, and a dry copier can make instant copies when required.

## EASY consulting in East Anglia

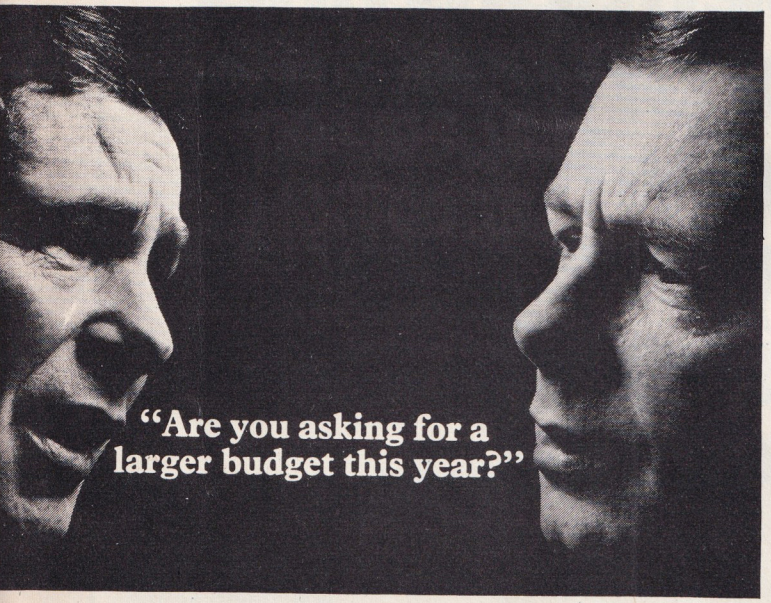
A new freelance Norwich-based company—East Anglian Systems Ltd—has been set up to offer a comprehensive consultancy and computer service to the Eastern counties.

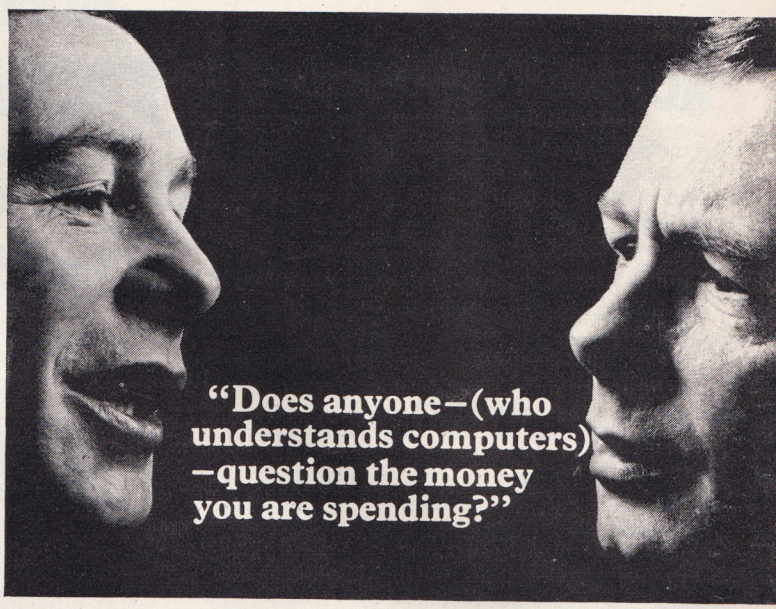
EASY will be offering facilities to deal with operational research, systems and programming and general consultancy for existing and potential computer users.

The company, which has available a team with experience in most makes of computers, will be writing various software packages to cover such applications as payroll, sales and bought ledgers, stock and production control, and associated systems.

As soon as the anticipated local business has been built up, the firm intends to expand beyond the boundaries of East Anglia.

# Ask yourself the following questions.



Some Horrible Truths:

1. Almost a quarter of all computers could be of smaller configurations if one routine job did not have to be done on them.

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**COMPUTIME**

# Key-Edit in Britain

A new integrated data preparation system, produced by a Canadian company and available in the US nine months ago, is now available in Britain. The system is called Key Edit, and the manufacturer is Consolidated Computer Services Ltd of Toronto.

Tim Wickes, CCS managing director and vice-president for European Marketing on the parent company's board, feels that Key Edit is the most versatile of any data preparation system so far announced. "It is also," he said, "significantly less expensive at around £30,000 for the basic equipment than competitive integrated systems."

The system consists of a 64-character keyboard unit connected directly to the multiplexor through its own cable. The controller for the system can handle up to 32 stations and the intermediate storage. This is a high-speed magnetic drum produced by Vermont Research Corporation. The central processor is a PDP8 computer which provides an input editing capability that reduces verification to the minimum, connected to the magnetic drum for interim storage and automatic pooling. Output is either magnetic tape or disk in the third-generation code.

Principal economic operating advantages of the Key Edit are the elimination of multiple tape drive units and the fact that built-in editing programs correct errors in source material at the initial preparation stage rather than after main computer runs. Wickes says: "We were early in the field with a really effective system and are getting excellent results in Canada and the US."

Consolidated Computer Services are remarkably candid about Key Edit's competition in the multiple keyboard data entry system and indeed produce a product comparable with the seven companies known to have similar systems at some stage of development. Those companies are Computer Machinery Corporation with *KeyProcessing*, Inforex with *Key-Entry*, Systems Engineering Laboratories—*Keytran*, Penta Computer Associates—*Keylogic*, Logic Corporation—*Keydisc*, Realtronics (Cybernetics International) *R1 System*, and General Computer Systems—*Data Tape*. Although it is difficult to assess each system compared to Key Edit, it is apparent that with the exception of Inforex, the CCS purchase price is well below the competition. The reason for the low cost of the Inforex system is that it has been designed for installations containing four to eight keypunches, whereas all the rest accommodate at least 30.

CCS has also tried to determine forthcoming competition. It expects IBM, Mohawk, Honeywell and General Electric to join the rush. No estimate can be given of when IBM will enter the field as this will depend on the speed with which older keypunch machines are replaced by other systems. Mohawk and Friden have recently announced multiple keyboard systems which do not incorporate small computers. Although these eliminate the need for pooling, Key Edit may have an advantage with the editing capability. Another advantage CCS also feels it has is in the doubtfulness that Honeywell and General Electric will be able to deliver a multiple keyboard system until at least a year from now, assuming they have them under development.

**Time sharing too.**—CCS has also developed a time-sharing system, although it will not be available in this country until later this year.

The CCS 2100 system is capable of simultaneous use by up to 16 terminals employing the Basic programming language. The new system will be marketed in a price range from $125,000 to $150,000. Monthly leasing prices vary in the US from about $2,500 to $6,700 depending on the length of lease and the number of options. The company has recently received a purchase agreement for up to 35 complete systems from Computer Solutions, with a total potential value of $4½ million, and a signed order has been received for one system from Wingate Computer of Rhode Island, to be delivered in March. CCS hope to sell or lease 30 systems in 1970.

In addition to the sale or lease of computers the company hopes to establish a number of time-sharing bureaux of its own in Canada, where it will be possible to provide a service at a cost far below that of the competition. The lower cost of the service is expected to open up new markets, such as the small business which could normally not afford the average time-sharing service.


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## HONEYWELL FOR GERMANY

Three German companies' headquarters in Munich have ordered Honeywell model 125 computer systems. Total cost is estimated to be in the order of £350,000.

The first company, Amphenol Tuchel Electronics, installing a £116,000 system, is an important manufacturer of connectors, potentiometers, meters and contacts.

Bayrische Landesversorgung, a grocery wholesale chain is another German company with a £110,000 125 on order, using a magnetic tape system with 20,000 characters of main memory to replace a punched card system. The company has thirteen cash and carry operations in Bavaria.

The final order came from Otto Schiller, one of Germany's largest drawing equipment organisations. The computer has already been delivered.

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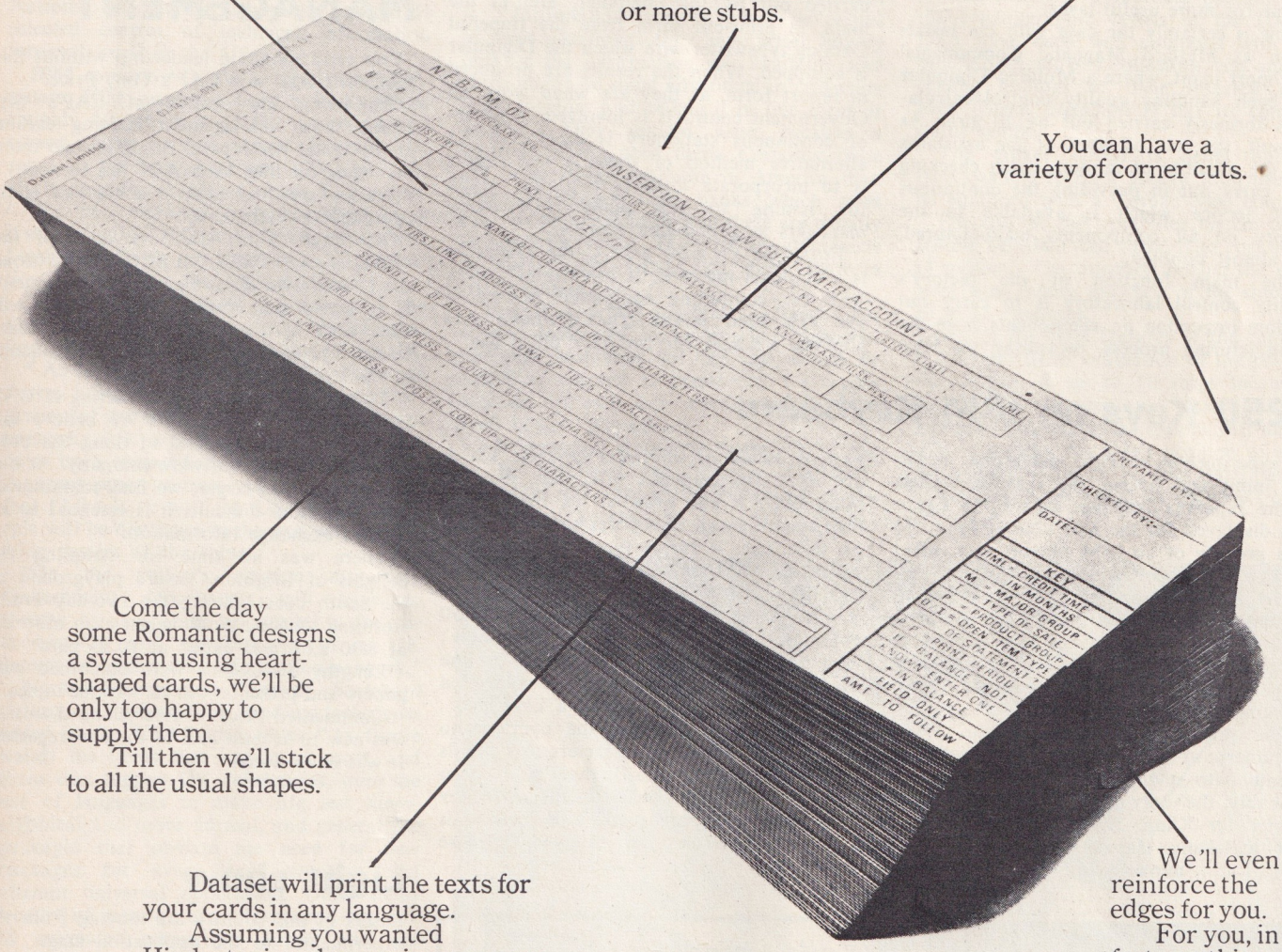


Come the day some Romantic designs a system using heart-shaped cards, we'll be only too happy to supply them.
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Dataset will print the texts for your cards in any language.
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# Digiputer saves drudgery

Computer thinking has gone a long way from the 'how many people will it save' school of thought, so far in fact that it is often forgotten that a relatively cheap little system can do routine work in superior fashion to human labour and free that labour for more useful tasks.

This is certainly the case with the installation at Mullard Magnetic Components' Southport plant, where a Muldivo Digiputer has been handling quality control calculations formerly carried out by 20 girls. As a result, the rate of work of the assistants and the quantity of random batch checking they carry out in providing the continuous audit service which is available to the factory on all components manufactured, has almost doubled.

The main function of the factory's quality control laboratory is to carry out random inspection on components from the manufacturing process, measuring the electrical and mechanical properties to ascertain whether these meet specification requirements and, depending on the results of these sampling tests, production batches are either passed or rejected.

Results obtained from calculations carried out by the Digiputer, are, in the main, in print-out form from the Imperial Datalog typewriter with which the Digiputer is equipped. When the results are produced in report form, as they are when work on Government contracts is involved, a system of continuous stationery is employed. An alternative method of showing test results is to incorporate them in a plotted graph for issuing to the plant's production managers as production reports.

From the physical aspect, the Digiputer is a compact machine. It consists of a desk with the computing equipment housed in the right-hand plinth. The left-hand side contains drawers for ordinary office use.

*Muldivo's Digiputer lets QC girls inspect components more carefully.*

## 3250 Keys on IBM Keyboard

An experimental keybord and printer which can input and output the three alphabets in the Japanese language as well as Latin, was displayed for the first time at Expo '70 in a preview of an IBM presentation called 'Man the problem solver.'

The keyboard and printer are used in conjunction with an IBM 360 and an IBM 2250 display unit for the production of Kanji (Chinese graphics), the written language of Japan, of which there are 10,000 characters.

The printer prints any of the Kanji characters at 300 16-character lines per minute onto standard business forms; it is probably the only data processing impact printer for Kanji. It also prints Hiragana and Katakana (Japanese phonetic alphabets), Latin, numeric and punctuation. The various kinds of character images, which are stored in magnetic disk files, may be intermixed. It can print up to 16 quarter-inch-square Kanji characters simultaneously on each line. It forms the characters by a series of overlapping dots which create straight or curved lines.

The Kanji keyboard comprises 3,250 characters from the separate alphabets; and it can be used either as an on-line input terminal for a computer-controlled graphic display or to control a keypunch.

To make it easier for the operator to operate the keyboard, characters or symbols are grouped in 'areas' that have been predetermined on the basis of the frequency with which they are used. This method is similar to that used on standard Japanese typewriters.

## TRAINING MANAGEMENT

"You can't maintain leadership without this kind of thing," says CAP's Tony Price.

Following the success of CAP's first 'think tank' management training session at the Hotel Metropole, Brighton, two more are being planned as part of the company's drive to keep management abreast of latest company developments.

The first 'think tank' took 46 of the company's top staff from Britain and abroad for two days to discuss project management. It is likely that future 'think tanks' will deal with systems and design, and team leadership. They may also include attendance by middle level management.

Tony Price, director of marketing of CAP Products told *Dataweek*: "We believe this is the first time this kind of thing has been done by a British software company. As our company grows larger, we find communication gets more difficult. It is essential to be able to exchange information."

There was no time for sampling the delights of Brighton, leisure playground of the south coast, during the two-day brainstorming session. Work began each morning at 8.30 a.m. and ended at 10.30 p.m.

Lengthy discussions were combined with papers and presentations on various topics.

Commented Price: "Everything discussed was new to at least half of the congregation. It was educational."

## Light show

Lasers in this country are moving from the experimental to the application stage. The exhibition being presented at the US Trade Centre from May 11 to 15 will feature many new and advanced products, including fibre-optics, infra-red equipment, lasers, photocells, and photomeasure equipment.

This equipment should be of particular interest to the aircraft, communications, construction, diamond, watchmaking, electronic equipment, medicine, military, space and nucleonics industries.

The exhibition, which will be mounted by the US Department of Commerce, will feature most of the American companies in this field.

### *Kode's model 72B*

The Kode model 72B keypunch verifier, the latest of the Kode products which was exhibited at the Business Efficiency Exhibition in Dublin this month. The 72B comprises the Kode keyboard and reader with a paper tape punch which together with the controls, associated electronics and full paper handling facilities are incorporated in a disk unit. A wide range of data preparation tasks may be handled including punching, verifying, tape copying and master editing.

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# UK lags in retrieval systems

"During April/May 1969 two members of the Working Party (under the Computer-aided Design Committee) Squadron Leader Blackney of the RAF Maintenance Data Centre and Marion Scatchard of the National Engineering Laboratory, visited 44 selected centres of technical information retrieval work in the USA.

**IBM country.**—Of the centres using computers, IBM machines have a lion's share, roughly 60 per cent of the centres in the survey. Next in line comes Univac with some 20 per cent share and CDC and GE are neck-and-neck with a rough 10 per cent.

The two working party members were given slightly different briefs, Squadron Leader Blackney has dealt with "Information retrieval for the USA designer."

"Overall the findings indicate that the USA designer is better served by information services than his counterpart in the UK.

"As for the future in the USA, there are moves being made towards the closer integration of the national technical information network, and several independent projects have been initiated to study this problem. A recent paper on one such study concludes that 'Like it or not, the US Government's role will be dominant in the national information system of the future.'

"In the author's opinion our own Government departments will have to assume an increasing responsibility for the sponsorship and development of a UK integrated engineering information network."

**Normal languages.**—Marion Scatchard writing on "Information handling techniques noted in the USA" also notes "In future trends the items that impressed most, and those that suggest UK deficiencies, were the use of languages to make life less hieroglyphical and more normal, and general file packages that obviate the need for new packages for every new situation and attempt universal application. Other items worthy of mention are information for sale in computer compatible forms and the simultaneous access to several banks with only one remote entry."

Scatchard brings up one interesting point that is probably highly relevant. "No figures for cost effectiveness were given and it is very difficult to estimate the situation. Where people were prepared to discuss this, they stressed that they thought their effectiveness lay in the saving of time and in the completeness and/or adequacy of information available rather than with actual cost. But it is difficult to judge, because the Americans have a prevalent attitude that cost is no object where Government contracts are concerned—and this is the situation in so many cases."

Scatchard's other very relevant comment is: "Information banks have been developed to meet situations; they have arisen largely because the information was available, and there might be some advantage in collecting it all together and selling it in one form or another. They seldom arise because a designer would need them. Certainly there are more banks available in America than here. There are data banks which need analysis and evaluation and these are usually in specialist areas. There is an abundance of library type banks, far more than in Great Britain."

This is a pretty essential document for anyone interested in information retrieval. Potential customers for the report will be doubtless relieved to know that the report contains its own key words and abstract. Well healed, physician!

"Information Retrieval in the USA" by A. B. Blackney and Marion Scatchard. 164 pages and appendices. Published by the Ministry of Technology. GAIL PURVIS

## COMPUTERISED SCURVY

There's nothing really so curious about a ship-board computer. Oceanographic vessels in the USA and UK have been well equipped with computers, the Norwegian liner *Taimyr* is equipped with a Nordata computer and the oceanographic vessels of the UK and USA have been well equipped with computers both actively collecting data and processing findings of their research crews; even *Queen Elizabeth II* has its computer status symbol.

The tanker which is being built by Ishikawajima-Harima Heavy Industries will be equipped with a Tosbac 3000 computer.

The cost of this computer system will be around £400,000 (the vessel is to cost around £4 million). The intention behind the investment is to reduce the crew of the ship from 30 to 15 members.

One of the main features of the computer system will be its evaluation of the positions and course of up to 10 ships located by radar, so reducing any possibility of collision. The computer system will also be able to identify the ship's position to within 200 miles by means of four satellites and from calculations based on the ship's course and speed.

Sir John Wall, chairman of ICL. at a reception for Brisbane staff. Left to right, Mr John Marshall, Miss Stuart and Mrs Dianne Ward. The photograph was taken during his world tour.

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Our clients require both junior and senior analysts and a project leader. A minimum of 18 months' experience of commercial applications is a prime requisite. A programming background would be an advantage. Every encouragement will be given for suitable applicants to advance to management positions. **Ref. WI 705**

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Several of our London clients require programmers with at least one year's experience with COBOL, BAL working under DOS or OS. PL1 would be an advantage, or any other high-level language. The applications are commercial and our client companies pay the best salaries and fringe benefits in the industry with excellent career progression opportunities. **Ref. WI 713**

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Several client companies are interested in programmers and analysts on a contractual basis. If these opportunities are of interest to you contact us immediately. **Ref. WI 726**

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**LONDON N.1. TELEGRAMS: HALPERS LONDON**

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## DATA PROCESSING TRAINING OFFICER

A new post has been created for a Training Officer in our Data Processing Department who will be responsible for the training of computer personnel.
The man appointed will be required to inaugurate courses for Systems Analysts, Programmers, and Computer Operators, organise the education of user departments, and be responsible for training to correct standards.
Our computer is an ICL 1904E, including EDS, and we use COBOL but would also prefer applicants who are familiar with PLAN.
This post would suit a man of mature outlook with a leaning towards education and training in the computer field.

*Applications, in strict confidence, giving age, qualifications and experience, together with present salary, should be addressed to:*

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**ELECTROLUX LTD., OAKLEY ROAD, LUTON, BEDS.**

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ANALYSTS Should have a good manufacturing background.

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Up to £3,000

A well-known group producing a range of nationally known consumer products is strengthening its data processing department. A large third generation configuration is currently in use on a variety of applications. The location is in Scotland and these new appointments provide excellent long-term career prospects with a vigorous, expanding group which has a reputation for good working conditions and very generous fringe benefits. Initial interviews may be in Edinburgh, Glasgow or London. Candidates' identity will not be revealed to our client until specific permission is obtained at an initial confidential interview with a P.A. consultant.

**Assistant Programming Manager**

The appointment calls for a knowledge and experience of managing a programming function. The successful candidate will deputise for the Programming Manager and the key responsibilities will include programming resource allocation to projects, performance assessments, implementation of standards and training. Salary up to £3,000. **(Ref: COM30/3889/DWAssistant)**

**Systems Analyst**

He will work on complex, large scale systems design initially covering an extensive management information system. He will prepare systems specifications and be involved in the program specification stage. Salary up to £3,000. **(Ref: COM30/3890/DWSystems)**

**Programming Project Leaders**

Experience of high level languages, preferably COBOL, is essential. This should have been gained on third generation, multi-programming equipment. Controlling a project team, he will take systems from systems specification through programming specification to final implementation. Salary up to £2,600. **(Ref: COM30/3891/DWProject)**

**Programmers**

High level language and tape or disc experience are essential. All programs are written in COBOL. This is a large and interesting programming environment; working conditions are excellent and there are opportunities for advancement within the group. Salary up to £2,000. **(Ref: COM30/3892/DWProgrammers)**

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## Computer Salesmen
£4,500–£9,000+

An American manufacturer of data processing systems requires a number of already successful computer salesmen. The company's systems are expensive, technologically way ahead of the field and are in a sector of the market which has a projected growth rate which exceeds that of overall computer usage. Candidates in their late 20's or early 30's must have had a computer manufacturer's training and highly successful computer selling experience. Our client wants only top salesmen and will pay well. Guaranteed earnings are £4,500 and reasonable success could double this figure. This is a young, exciting, profitable company based in the London area. Candidates' identity will not be revealed to our client until specific permission is obtained at an initial confidential interview with a P.A. consultant. **(Ref: COM30/3887/DWSalesmen)**

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## PA Management Consultancy

PA is a major international management consultancy company with over 800 consultants operating in the United Kingdom and abroad. Today it is one of the leading organisations of its kind—in terms of size, in range of services and in international coverage. Within this framework, there is a strong and expanding management sciences group advising clients on the effective use of computers, systems design, programming and operational research.

This expansion continues in 1970 and staff is required for:

COMPUTER DIVISION—for computer feasibility studies, equipment selection, installation planning, computer audits, bureau studies, etc: aged 30-35 with at least 5 years' in EDP with a manufacturer or user.

PROGRAMMING DIVISION—for systems design, contract programming, installation standards, programming strategy, installation appraisal, etc: aged 23-28 with at least 3 years' commercial programming.

O.R. DIVISION—for the business applications of mathematical statistics, linear programming, simulation, network analysis, model building, etc: aged 28-35 with a maths or science degree and 4 years' O.R. in industry.

The successful applicants must also meet our essential requirements: University degree or equivalent; thoroughly professional background; several years' practical experience; wide variety of business applications; confident and enthusiastic personality.

Starting salaries will present no problems for the right men. There are real prospects of rapid advancement to £6,000 and beyond.

*Comprehensive career details, to be held in strict confidence, should be sent, quoting ref: C2034/DWto:*—**The Staff Relations Manager, PA International Management Consultants Ltd., 2 Albert Gate, Knightsbridge, London S.W.1.**

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PA *REPLIES: Please follow the reply instructions carefully and unless otherwise stated address applications, quoting the relevant reference number on the envelope, to: COMPA, P.A. Management Consultants Ltd., Hyde Park House, 60A Knightsbridge, London, S.W.1.*

**EDP MANAGEMENT ▪ OPERATIONS RESEARCH ▪ SYSTEMS ▪ PROGRAMMING**

# Systems Analyst £2,000-£3,000

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Order invoicing via mark sense cards from 11 regional depots covering over 1,000 retail outlets.
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We require a Systems Analyst with a minimum of one year's practical systems work. Salary will be negotiable in the quoted range according to candidate's experience.

*Write for application form to:—*
**Data Processing Manager,**
MITRE SQUARE, E.C.3.

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**BATH UNIVERSITY OF TECHNOLOGY**

**Computer Unit**

# PROGRAMMER

A vacancy exists for an experienced Programmer whose duties will include assisting University computer users. An interest in statistical work is essential.

The University has an ICL 4/50 computer with telecommunications equipment to participate in the South West Universities' integrated computer network.

Starting salary within the ranges £1,030–£1,395 or £1,490–£1,990 according to age, qualifications and experience.

Application forms from the Registrar (S), The University, Bath, BA2 7AY, quoting reference 70/14.

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**SENIOR SYSTEMS ANALYST**
(ref. 823)
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(ref. 824)
**BUSINESS SYSTEMS PROJECT LEADER**
(ref. 825)

**Salary around £3,000**

Are you looking for a well paid challenging assignment working on a Honeywell Installation, in a new computer centre set up by a rapidly developing London company?
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The assignments will be in a wide area of application work embracing Planning, Finance, Marketing and Storage. Please write in strict confidence quoting the appropriate reference number to

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The National Marketing Manager will be responsible for initiating and managing all marketing, market-oriented systems analysis and sales activities of the company. A highly successful record of marketing EDP or closely related services is the essential requirement of this appointment. Basic salary will be at least £5,000; the right person will probably earn an additional 20% - 30% of basic salary on bonus. Location London. A. F. Donovan reference KF.1152.

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For this appointment, managerial ability to organise, co-ordinate, and maximise the profitability of a number of processing centres will be more important than technical knowledge of EDP. Some management experience in the computer industry, however, is essential. Location London. Basic salary will be negotiable above £4,000. Bonus arrangements for this appointment will be the same as for the Marketing Manager. A. F. Donovan reference KF.1153.

**The MSL Consultant has analysed each appointment**
Further information will be sent if you provide your name and address by telephoning 01-629 1844 or writing to the consultant quoting the reference. Your enquiry will be in confidence.

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| Senior Programmers | £1,800–£2,250 |
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| Operations Managers | £1,800–£2,500 |
| Operations Supervisors / Chief Operators | £1,500–£2,000 |
| Shift Leaders | £1,300–£1,800 |
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# Systems Analysts

## Manchester and Kilmarnock

The continuing expansion of our Management Services function has created vacancies at our manufacturing location in Manchester and Kilmarnock, where IBM 360/30's form the basis of the D.P. installations.

Both positions offer outstanding opportunities for career development in a progressive D.P. environment where the emphasis is currently on developing a sophisticated system of integrated manufacturing control. In addition to valuable experience in this and other advanced applications, we can offer high starting salaries, based on experience and qualifications, and excellent employment conditions which include relocation expenses where applicable.

Applicants should have at least two years' progressive systems experience, plus the ability to produce thoroughly professional work with a minimum of supervision.

Please write, giving details of age, education, experience and present salary, to:

**I. R. Lloyd, Personnel Department,
Massey Ferguson Manufacturing Company,
Banner Lane, Coventry, CV4 9GF.**

LIVERPOOL
## DAILY POST & ECHO
LIMITED

# PROGRAMMERS

**The Liverpool Daily Post & Echo Ltd., a large provincial newspaper group, requires additional COBOL programmers to join an expanding department**

**An ICL 1901A with 16k, paper tape input and EDS is already used on a number of commercial applications and there is a demanding schedule of work planned for the next two years.**

**A minimum of 18 months' COBOL experience, preferably on a 1900 series is required. Some experience of discs would be advantageous but we will provide training where necessary.**

**A starting salary of up to £1,600 per annum will be paid with 3 weeks' holiday.**

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# Systems Programmers and Analysts

The Digital Systems Department of Ferranti Limited is recognised as one of the leading suppliers of Real Time Digital computer systems for both civil and military applications in Great Britain and Overseas.

Owing to the continued success of systems based on the Ferranti F1600 range of computers, and the consequent expansion of the Department's programming activities, vacancies exist for programmers and analysts at Senior and Professional levels.

These are responsible positions, and the people selected will be working with experts on the design and development of Real Time Systems software, Compilers, and Operating Systems.

We are looking for people with the following qualifications:—

**SENIOR PROGRAMMER/ANALYSTS** will have a minimum of 4 years programming experience, will be qualified to degree level or equivalent, and will be able to show evidence of achievements.

**PROGRAMMERS** (Professional) will be qualified to degree level or equivalent, and will have a minimum of 2 years programming experience.

Vacancies also exist for Trainee Programmers with good 'A' level results in Science subjects.

In view of the continuing expansion of the Department, salaries and prospects for advancement are excellent. The Digital Systems Department is located at Bracknell, Berkshire, in pleasant countryside surroundings, within easy reach of London.

Applications, quoting reference D/113/AP, should be addressed to

**Mr. D. O'Connor, Personnel Officer, Ferranti Limited, Digital Systems Department, Western Road, BRACKNELL, Berkshire.**

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# Gillette IBM 360 Operators

Our current machine at Gillette is a 360/30 (64K, 4 discs, 4 tapes) which we work in three shifts on a wide range of commercial applications.

We need operators with at least 12 months' real experience of operating under DOS, who are prepared to work shifts and occasional weekend overtime. We are prepared to train suitable candidates for programming after a period of operating, if they show sufficient enthusiasm and aptitude.

Starting salaries are excellent and will depend on experience. We provide generous company benefits including non-contributory pension and discretionary bonus schemes. If you are interested in working in a progressive international company, write to:

Gillette

**Janet Vivian**
**Gillette Industries Limited,**
**Great West Road,**
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# Programmers:

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Here is your opportunity to take a vigorous step forward to become a vital member of Isis—which is proving to be one of the fastest-growing companies in Britain's computer service industry. We are among the oldest-established organisations of our kind. We are part of a multi-million pound Group with many far-ranging activities. We are totally British and entirely financially sound. Here, then, is an unusual opportunity, indeed.

You will specify and/or write programs from systems specifications either as a project leader or a member of a team enjoying a high degree of responsibility working on a variety of applications and systems, using the most appropriate machine configuration. You must have the ability to program to a typed schedule, backed by 24 to 36 months' experience in one or more of COBOL/PLAN/BAL/PLI. You will enjoy interesting fringe benefits plus a salary of up to £175 per month. If you're aged 19–30, with a positive and thoroughly professional outlook, 'phone or write us now and we'll arrange an evening interview.

*Contact*
**Mr. H. P. Brennan,**
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**Isis Computer Services Ltd.,**
**15 Lime Street, EC3. Telephone 01-623 0111.**

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**John Dalton Faculty of Technology**

**DEPARTMENT OF PHYSICS AND MATHEMATICS**

Applications are invited for the following post:

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The appointment will be made on either scale according to age, qualifications and experience. Previous operating experience is desirable; candidates without operating experience, but having good G.C.E. 'O' levels will be considered.

The Faculty has an Elliott 803 computer.

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£965–£1,130

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**(£965–£1,800 per annum)**

Applicants must have experience in Assembler Language, preferably 4100 NEAT.

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Applications, on forms obtainable from the Town Clerk, Civic Offices, Swindon, Wilts., should be returned by 3rd April, 1970.

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His department's responsibilities include: providing a high calibre technical trouble shooting service to our project teams; estimating projects, quoting to clients and scheduling and controlling programming projects; evaluating manufacturers' and other software, and developing and licencing packages; planning and organizing advanced technical training for company and clients' staff.

The man we want to join us is a top level professional, possibly a chief programmer or programming manager, with experience of two current ranges of computers. He is likely to be working with a software house, bureau or large user, and earning around £4,000 p.a. We expect to negotiate a starting salary in the region of £4,500 p.a., but it could be more. There are very definite career prospects, and every opportunity for the right man to progress to the top of the firm.

If you would like to meet our management team to discuss the appointment and have a look at the way we operate, please reply, in confidence, quoting ref. DW.280, to BOX No. DW. 339. Dataweek, Mercury House, Waterloo Road, S.E.1. We will then be in touch with you straight away.

# 360 ANALYST/ PROGRAMMER

A leading firm of Lloyd's Insurance Brokers is embarking on a plan to reorganise its administrative and accounting systems making extensive use of computer facilities.
As a result of the above development, the Company seeks to appoint an analyst/programmer to supplement existing systems and programming effort.
A minimum of 18 months' IBM 360 programming experience using DOS and/or OS, COBOL and /or PL/1 is required. Knowledge of insurance and/or broker accounting procedures would be an advantage but not an essential.
This appointment will offer the successful candidate the opportunity to develop his potential as a systems analyst. A rewarding salary will be offered. Send full details of salary and career to date to: The Personnel Manager, Morice Tozer & Beck Ltd., 27 Clements Lane, Lombard Street, London E.C.4.

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**Operators**

We are offering excellent scope for career advancements and the opportunity of using your ability to the full on a variety of interesting projects. All positions carry attractive salaries and generous additional benefits include non-contributory pension and life assurance schemes.

Write with full personal and career details to Mrs S. A. Fayers, L.R. Industries Limited, Hall Lane, Chingford, London, E.4.

Here is an opportunity to live and work in a congenial part of the country, within a National Park Area.

**PEMBROKESHIRE COUNTY COUNCIL**

who have a well established ICL 1903 16K computer installation, have a vacancy for a

# SENIOR PROGRAMMER

for new, varied and interesting work. An opportunity to undertake systems analysis may be available later.
Experience in PLAN essential, a knowledge of COBOL would be an advantage.
Starting salary between £1,565 and £2,015 depending on experience. Applications quoting 2 referees to the County Treasurer, P.O. Box 8, Haverfordwest, by 8th April, 1970.

**The Barnsley British Co-operative Society Ltd.**

# COBOL PROGRAMMER

Applications are invited for the post of programmer in the Computer Section of the above Society.

Applicants should have had at least 12 months' programming experience.

The Society operates a Honeywell 125 with 24K storage.

Applications stating age, experience and salary required, together with the names of two referees should be forwarded before 8th April, 1970, to:

**The Secretary,**
**Barnsley British Co-operative Society Ltd.,**
**Wellington Street, Barnsley, Yorkshire.**

**HAWKER SIDDELEY AVIATION LIMITED**

# SYSTEMS ANALYST and PROGRAMMER

We are currently developing integrated systems in the production, financial and commercial areas, in conjunction with other Hawker Siddeley Aviation Sites.

The systems are based on the I.C.L. 1900 Computer range and will involve the use of magnetic tape, random access and data collection devices.

We need a systems analyst and a programmer with a minimum of 2 years' experience.

Please write giving details of qualifications, experience, age and present salary to the Personnel Manager. (Telephone Hamble 3371.)

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We are a progressive international organisation manufacturing products for the oil, marine and automotive industries. We have a 32K System 4/30 with discs which is used for accounting, sales and production control.

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**If you are a**

## COMPUTER PROGRAMMER

with several years experience in programming and you would like to pass on your skills to others, then why not make a profitable change to a career in programming publications.

## Ferranti Digital Systems

may be looking for you and others like you to help them write and publish a series of software handbooks ranging from textbooks in basic programming techniques and high level languages to system software manuals for sophisticated real-time computer systems.

We shall of course expect you to have a good command of English, a lively power of expression and a keen desire to communicate your ideas to others.

Why not write, quoting reference D/121/AP to

**Mr. D. J. O'Connor, Personnel Officer,**
**Ferranti Limited, Western Road,**
**Bracknell, Berks.**

for an application form and further details of these responsible positions and the good salaries they command.

## FERRANTI

## Analysts and Programmers . . .
## Are you serious about your career?

**If so, you could achieve your ambitions with us.**

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A leading firm of Management Consultants, with an expanding E.D.P. Implementation Division staffed by Computer Specialists who are in training to become consultants in two to three years time.

WE OFFER:—

—A career path to Management Consultancy, with individual career planning updated twice a year.

—Up to five weeks training a year in consultancy skills and management techniques.

—Challenging work on a wide range of assignments, advising and supervising our clients' staff in the implementation of computer projects.

—A high salary, in a range of up to £4,000 per annum, reviewed every six months.

—Future opportunity as a management consultant to earn up to £6,250 per annum.

WE ARE LOOKING FOR:—

Computer professionals, probably graduates, who are serious about their careers and are determined to move fast.

IF YOU ARE INTERESTED:—

Send a brief career summary, in strict confidence, quoting ref. D.W.281 to Box No. D.W. 340, Dataweek, Mercury House, Waterloo Road, S.E.1.

# Analysts & Programmers

We have a wide selection of vacancies for experienced staff at all levels at salaries up to **£3000**

We offer:

- Local Interviews—National Coverage
- Completely confidential service.
- Free Career Advice for Applicants.
- Highest ethical standards.

*Telephone:*
**BRISTOL 0272-24851** for West Country and South Wales
**BIRMINGHAM 021-643-9661** for Midlands.
**LONDON 01-886-9201** for London and South.

*or write to LCC, GROSVENOR HOUSE, BENNETTS HILL, BIRMINGHAM 2, quoting Ref. DW/1.*

LCC

Lawden Computer Consultancy Ltd
Branches throughout the United Kingdom

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**CHILTERNS JOINT COMPUTER COMMITTEE**

## OPERATIONS SUPERVISOR

An Operations Supervisor is required to take charge of computer operations and data preparation. Staff control and instruction of trainee operators will form an important part of the duties of the post.

Appropriate training will be given in the technical aspects of the work.

This is a new installation, operating an N.C.R. Century 100 Computer, and offering an interesting opportunity to the right person.

Salary will be up to £1,345 per annum.

Applications to The Computer Manager, Chilterns Joint Computer Committee, 80 Oxford Road, High Wycombe, Bucks.

---

# British Steel

## Programmers

## Systems Analysts

Are you looking for a challenging ground-floor opportunity to develop systems outside the routine accounting applications; systems to meet the needs of management controlling a new giant organisation?

Systems Analysts must be familiar with working in a business environment and be able to demonstrate the ability to:—

Plan and Control Projects
Organise and Co-ordinate
Achieve Results

Programmers must have a proven record of technical success and be able to communicate clearly.

Starting salaries will be competitive and related to qualifications and experience. Location: Central London.

*Write, giving brief details of experience to date and ambitions for the future, to:—*

**The Personnel Manager (Head Office),**
**BRITISH STEEL CORPORATION,**
**33 Grosvenor Place,**
**London, S.W.1.**

---

POTATO MARKETING BOARD

## COBOL

### PROGRAMMERS-ANALYSTS

FOR POSTS IN OXFORD

**THE JOB:**
Programming a Honeywell mixed tape and disk computer in the first instance, progressing to systems analysis and design later. This is a novel application offering experience of a fully integrated business system.

**EXPERIENCE DESIRABLE:**
Should have written a number of successful Cobol programs preferably for a similar computer. Background of accountancy, general office work and some systems analysis would be advantageous.

**SALARY:**
On a scale rising to £1,845 per annum, placing according to ability and experience.

**PROSPECTS:**
Opportunities to work on statistical and scientific projects will occur. Training in O. & M. and systems analysis will be given. Promotion within the D.P. Dept., or in other sections of the organisation are open to D.P. staff.

**OTHER BENEFITS:**
The Board operates a Pension and Life Assurance Scheme. Attractive location in Oxford with canteen facilities.

**APPLICATIONS:**
Apply in confidence, with résumé of career to date to:—

**Personnel Officer,**
**Potato Marketing Board,**
**50 Hans Crescent,**
**Knightsbridge,**
**LONDON, S.W.1.**

API INTERNATIONAL
133 OXFORD STREET AND
201 WARDOUR STREET
LONDON W1 01-734 8222

01-734 8222

api
INTERNATIONAL

# SYSTEMS ANALYSTS £2,250/£3,000: SEE OUR FULL ADS!

.....DIAL THE "HOT LINE".....NOW.....

## COURTAULDS GROUP
## PROGRAMMERS
### (UP TO £2,500)

**BALDOCK**

**HERTS.**

Kayser Bondor Ltd., requires a number of programmers to programme the complete system re-design of their current LEO 111 applications for an I.B.M. disk 360/25. These cover order analysis, stock reordering and sales ledger work; and will be followed by new projects in production planning and control.

Applicants should have experience of third generation equipment and preference will be given to those with I.B.M. Assembler and/or P.L.I.

One of the appointments will be at senior level and should be of interest to someone seeing himself eventually as a manager.

Salaries offered are in line with market rates and up to £2,500 is the range for the Senior post; working conditions and prospects are excellent and Baldock is in a good residential area, in easy reach of London.

**Apply in first instance with details to W. A. Burley, Kayser Bondor Ltd., Baldock, Herts, or telephone Baldock 3331.**

## Senior Programmer
## Systems Programmer

### ...£2,000

**For 360/30 Disk/Tape Configuration in Mayfair**

Applicants for both positions should have a thorough knowledge of 360 Assembler language under DOS.

The Senior Programmer will be required to supervise a small team of programmers and to assume overall responsibility for complete projects.

The Systems Programmer will be responsible for all the installation's software including maintenance and the solution of any software problems encountered. He will also develop common I/O modules for use by production programs.

The Company is part of a large international manufacturer and distributor of hair beauty products, and offers luncheon vouchers, non-contributory pension scheme and 3 weeks annual holiday.

Please write or phone giving brief details to:
Program Manager, Golden Ltd.,
18 Bruton Street, London W1A 1BX.
01-629 8240 Ext. 146.

## Senior Programmer

We require a Senior Programmer for our Division Commercial Services Department at Oldbury near Birmingham.

We operate a project team environment in which the successful applicant will be directly responsible to one of three project leaders.

His main task will be to design and write commercial programmes for a Honeywell 200 computer and to assist with the design and implementation of computer systems.

Applicants must have had at least 2 years' programming experience which must have included the use of Cobol. Experience of programming in Cobol for a Honeywell 200 would be a decided advantage.

An attractive salary, dependent upon ability and experience, will be offered, allied to excellent supplementary benefit. Assistance with removal expenses will be given where appropriate.

**Please write for an application form to:**

**The Staff Officer,**
**Division Personnel Department,**
**Albright & Wilson Limited,**
**P.O. Box 3, Oldbury, Warley,**
**Worcs.**

**ALBRIGHT & WILSON LTD**
**OLDBURY DIVISION**

## Computer Manager for Harwell

Harwell needs a Manager to be responsible for the organisation, development and management of its central computer service.

Our present installation is an IBM 360-75, with two linked satellite computers controlling about 200 teletype terminals supported by our own multi-access system, HUW. We have an extensive sub-routine library, and a network of high-speed data links to small computers on-line to experiments is now being added.

We intend to advance the system by providing further interactive facilities including graphics terminals. We also intend to continue building our research and development effort on computer systems, which with our highly expert numerical analysis group interacts closely with the computing service.

To develop the Harwell installation in this way the Manager will receive all the necessary support and he will also control an experienced operations team and a number of programmers. The person we are looking for will have a good degree in mathematics or science and will have several years' experience in scientific computing.

The starting salary is within the range £2785-£3850 a year, and we can offer housing or assistance with house purchase.

*For more details and an application form please write to:*
**Appointments Section 'A' (A 5287/ 532 ),**
**U.K.A.E.A., A.E.R.E.,**
**Harwell, Didcot, Berks.**

# Management Services Manager £4,500

A leading Public Company in the field of marketing and maintaining communications equipment requires a Management Services Manager for their Head Office in London. His task will be to review and develop the Company's information processing systems, to exploit the use of the existing computer in this work, and to consider equipment expansion for future needs. He will have overall control of about 30 staff, including the Computer Department and O & M Analysts, and will be responsible to the Financial Director.

The position calls for a man with wide experience in the application of data processing in a commercial environment and a detailed knowledge of how accounting, production and statistical information must be presented for effective use by management in the control of a complex business. Leadership, tact and an ability to work at all levels are essential requirements for this post.

Applicants are likely to be in the 35-45 age range. A starting salary of around £4,500 is offered and there is a contributory pension and life insurance scheme. Prospects for promotion are good.

*Applications, giving brief details, should be addressed to Mr. P. R. Billinghurst, Spicer and Pegler & Co., 6 New Street, London, E.C.2.*

## UNIVERSITY COLLEGE, CARDIFF

### Computer Programmer

Applications are invited for the post of Computer Programmer in the Data Processing Section of the College Registry.

Applicants must have experience on I.B.M. 360 or System 4 computers and knowledge of COBOL is essential. R.P.G. experience will be an advantage.

The Data Processing Section has access to a System 4/50 in the College Computing Centre, and is now in the process of computerising both financial and student records.

Salary will be in the range of £1,240 (×£115)–£1,700.

Further particulars and applications may be obtained from the Registrar, University College, Cathays Park, Cardiff, and completed applications should be submitted within two weeks of the appearance of this advertisement. Quoting ADV/423/DW.

# are you a computer man with personnel experience?

**We're ready to pay the right man a starting salary of £2,750—£3,250**

The man we choose will be someone pretty special. Someone who can really help our Personnel Manager to help us find—and keep—the computer professionals we need to continue our present rate of growth in what we think of as our main asset. People.

Our increase in staff has run at 40% p.a. for several years now; and we depend a lot on Personnel to help us carry on this good work.

So the man we choose will need a rare combination of qualities and qualifications. This is his profile as we see it.

* In the 25-35 age bracket
* With at least 3 years successful computing experience
* Additional experience of interviewing and evaluating computer technicians; plus the necessary judgement, tact and understanding to make a good job of it.

If you think you fit this profile, you will want to know some of the things we have to offer you:

**Salary** This will start at a very reasonable figure: £2,750—£3,250 dependent on age and experience.

**Prospects** These, you can rest assured, are excellent; with promotion strictly on merit.

**Job Satisfaction** You'll be able to feel that you're doing varied, interesting and valuable work, in a very friendly and informal environment.

**Staff Ownership** The Company has a unique policy of staff ownership that makes for a stable and progressive Senior management.

**Fringe Benefits** These include an annual bonus, and a fairly rapid advance to 4 weeks holiday.

If you believe that you have something positive to contribute to the Personnel function at CAP, please apply, quoting reference DW 1020: by telephone to G. J. Elliott, 01-242 0021 (24-hour answering service) or by letter to the address below.

**CAP**

**Computer Analysts & Programmers Limited,**
CAP House, 14/15 Great James Street,
London, W.C.1.

## PROGRAMMERS (IBM 360)

Pay in range £1500–£2000. Good prospects for promotion to Senior Programmer or Systems Analyst. Please write, or dial automatic telephone number 01-499 2347, for further information about the Partnership, and an application form. Please quote reference number DW 990/51.

Department of Personnel,
John Lewis Partnership,
Oxford Street, W.1.
W1A 1EX.

## Cambridgeshire College of Arts and Technology

## COMPUTER OPERATIONS MANAGER

Required in Science Department for day to day running of computer service for College, local schools and other colleges in region. An I.B.M. 1130 system is to be installed in September 1970. Candidates should have operating and organisational experience in a computer centre: commercial and scientific experience and appropriate professional qualifications would be additional advantages. Salary on scale £1,575–£1,800 (under review), starting point according to qualifications and experience.

Further information and application forms may be obtained from the Head of the Department of Science, Cambridgeshire College of Arts and Technology, Collier Road, Cambridge, to whom completed application forms should be returned not later than 6th April, 1970.

## SYSTEMS ANALYST/ D. P. MANAGER

Systems Analyst seeking promotion to a position of D.P. Manager required for a new (3 tape/twin disc) installation in W.C.1 area. Age 30/40. Salary negotiable, around £3,000 p.a. Good prospects. Apply in confidence to :–

**D. H. Haydon**

**MEDICAL INSURANCE AGENCY LTD.**
**B.M.A. House, Tavistock Square,**
**London, W.C.1**

# Computer Operators

## Born under a wandering star?

Providing you've already had at least 18 months' 1900 or System 4 operating experience, you can give your career a big boost by joining our Operations Advisory Service.

Our main function is to provide all kinds of guidance on computer operations, particularly in the setting up and initial running of operations departments.

For a certain type of person, ordinary computer operating is too restrictive. You want to be out and about, working entirely on your own, quickly gaining the variety of experience which normally takes years.

We have vacancies in two categories—both require a high level of operating skill and ability to communicate.

**Site operators:** must be ready to move at short notice to help customers all over this country and overseas. You'll be expected to assist in on-site instruction.

**Operations advisors:** responsible for on- and off-line instruction of customers' staff. Again must be prepared to travel this country and abroad, and should be capable of providing documentary comment on operations standards and techniques. You'll need 2½ years' experience.

Bases: London, and Kidsgrove, Staffs.

Salaries are very good. Full expenses are paid plus allowances for shift work.

Please send details of your career so far, quoting reference D255S, to R. J. Brown, International Computers Limited, West Avenue, Kidsgrove, Stoke-on-Trent, Staffs.

**International Computers** | **ICL**

# Night Scheduler

"Co-ordinator supreme" would describe you best because—responsible direct to our Operations Control Manager—you're going to have total responsibility for internal scheduling as well as for time bought out.

So: you will co-ordinate the efforts of operations departments. Forward-load files. Liaison with Set-up Section and customers. Direct supervision over Transport Section, and the final distribution of all output, will be your responsibility.

To do all this, keep files updated, and implement plans to increase the cost-effectiveness of Control Section, will keep you busy.

High salaries, good incentive for shift work, exceptional company benefits are part of the pattern of working for this rapidly expanding company within an international group.

**Applications in confidence to: Bob Nimmo, ITT Data Services, East Barnet Road, Barnet, Herts.**
**Tel.: 440 5161.**

**ITT** Data Services

RANDALLS GROUP OF COMPANIES

## SYSTEMS ANALYST/PROGRAMMER

A Systems Analyst/Programmer is required who will undertake systems and programming responsibilities for a 16K Century 100 to be installed in August 1970. The successful applicant will be in the age range 20–25 and will have had about 2 years' programming experience. He will report to the Data Processing Manager.

A salary of up to £1,650 is offered to the successful candidate.

Apply to:

Data Processing Manager, Randalls Limited, Clarendon Road, BOREHAM WOOD, Herts. Telephone: 01–953 1616.

# ANALYST/ PROGRAMMERS

Laycock Engineering Ltd., a member of the GKN Group of Companies, are situated in a pleasant part of Sheffield near the border with Derbyshire.

The installation is a disk orientated IBM 360/30 operating under DOS using assembler language and PL1.

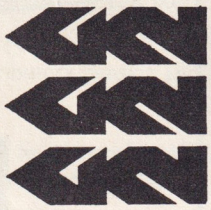
We wish to recruit persons with at least two years' programming experience in assembler language to work on the extension and integration of existing systems covering sales, order processing, purchasing and accounting.

A competitive salary commensurate with experience and qualifications will be negotiable.

*Written applications stating qualifications, experience, age, and present salary should be addressed to:*

**Mr. R. A. Revill,**
**Personnel Department,**
**Laycock Engineering Ltd.,**
**Archery Road,**
**Sheffield S8 0JY**

**Laycock**



## Samuel Osborn & Co Ltd

# GROUP DEVELOPMENT STAFF

The Osborn Group which has major interests in special steel making and tool manufacture is seeking to appoint the following staff in connection with the installation of an ICL 1902A Disc Based Computer in the last quarter of 1970. This is for extensive use in the sales, production and accounting area.

## SYSTEMS ANALYST

Applicants should be able to demonstrate a full understanding of the potential of computers to produce worthwhile Management information. Experience of implementing at least one major system is required, preferably in respect of cost and budgetary control.

## PROGRAMMER

Applicants should have had at least one year's experience of relevant applications, and should have a thorough knowledge of disc computers, experience of COBOL together with a knowledge of programming methods and standards.

*Please write stating age, qualifications and experience, together with salary earned to:*

OSBORN

**GROUP STAFF ADMINISTRATOR**
Samuel Osborn & Co. Ltd.,
P.O. BOX No 1, SHEFFIELD.

# *Senior Systems Analyst* *£3,750+*
# *Programming Analysts* *£2,750+*

## *for LUXEMBOURG*

Gramco International, S.A. a leading international investment group of companies with headquarters in the Bahamas, are installing a 360/40 in their Luxembourg branch and building up a computer team. The immediate requirements are:—

- SENIOR SYSTEMS ANALYST—to control a team of programming analysts and
- 4 PROGRAMMING ANALYSTS—for a 360/40 125K installation with terminal links throughout Europe. The main applications will be in the field of investment and financial analysis.

  For the senior position at least 3 years' systems and project leadership experience will be required; experience in accounting applications in banking, finance and investment work is particularly relevant. For the other positions a thorough knowledge of Cobol under D.O.S. for at least 2 years is required.

The salaries offered will depend on the calibre and experience of the candidates but will not be less than £3,750 for the senior systems analyst and not less than £2,750 for the programming analysts.

One or two of the programming analysts will have the opportunity of working for a short time at the Group's headquarters. With the continuing growth of the Group there are excellent opportunities for advancement and worldwide travel.

*All replies, which should quote reference W508, will be treated in the strictest confidence and should be addressed to the firm advising us on this appointment:*
*Binder, Hamlyn, Fry & Co.,*
*Management Consultants,*
*8 St. Bride Street, London, E.C.4.*

NATURAL ENVIRONMENT RESEARCH COUNCIL
NATIONAL INSTITUTE OF OCEANOGRAPHY

# SYSTEMS ANALYST

A Systems Analyst (Scientific Officer/ Senior Scientific Officer) is required in the Data Processing Group of NIO with specific responsibilities in the development of the shipboard data acquisition system of the Royal Research Ship "Discovery" which has installed on board an IBM 1800 with disk backing store and analogue and digital I/O facilities. The purpose of the system is to enhance navigational control during the ship's oceanographic research programme, to provide more precise and detailed oversvations of a variety of relevant parameters covering physical oceanography, geophysics, meteorology and biology and to enable substantial data analysis to take place on board before return to port.

Candidates should preferably have some previous acquaintance with the environmental sciences and a wish to pursue rewarding lines of research related to the Institutes research activities at sea. It is anticipated that some three to four months duty at sea may be required in any one year.

QUALIFICATIONS:
A good class honours degree or equivalent in an appropriate subject (Final year students may also apply).

SALARY SCALES:
Scientific Officer: (under 29 years at 31st December 1970) £1,071–£1,827. Senior Scientific Officer: (normally at least 26 years and under 32 years at 31st December 1970) £2,021–£2,491.

Initial appointments will be non-pensionable, but there are prospects of permanent and pensionable position. Exceptionally FSSU arrangements already existing may continue.

Application form and particulars from The Secretary, National Institute of Oceanography, Wormley, Godalming, Surrey.

Closing date: 30 April, 1970.

**DP** **DATA PROCESSING STAFF CONSULTANTS LTD.,**
**Crown House, Morden, Surrey.**

## ICL 1900

A 1903 Computer installation near Kingston wishes to recruit experienced PLAN Programmers and in particular Systems Analyst/Programmers for interesting development work. Attractive salaries to be negotiated.

PROGRAMMER **Up to £1,800 p.a.**
SYSTEMS ANALYSTS **Up to £2,000 p.a.**

## NCR CENTURY

PROGRAMMER: Programmer with High Level Language experience, together with background and ambition to warrant moving into Systems analysis **£2,000 p.a.**
Location Croydon—NCR Training Courses in Neat 3 and Systems Design included.

## NCR 500

PROGRAMMER: Two Programming vacancies, one located South London, one Sidcup, Kent. Both offer the opportunity to obtain experience in controlling the installation and partaking in the design of new systems. Programming ability and ambition to move ahead are the main criteria. Applicants with less than 18 months' experience will be considered. **to £1,600 p.a.**

## IBM 1440

1400 MAINTENANCE PROGRAMMER required by large Engineering Group, location Brentford, whilst transferring to 360-30. Good opportunities for developing to 360 work. Salary up to **£2,000 p.a.**

COBOL — RPC — PLI — BAL — HIGH LEVEL
We have a continuing demand for Programmers in the above languages and excellent salaries are available for people who can produce quickly and accurately.

May we suggest you write or telephone for further information, 01-540 7172, Monday through Saturday.

---

CADBURY SCHWEPPES offer

# Good Salary for Good Experience

Cadbury Schweppes Ltd., brand leaders in the food, drinks and confectionary industries are currently expanding their computer usage by the development of a number of varied, challenging and time critical projects in which top management have a continuous interest and involvement. A project planning and control system has been installed to assist a computer team in achieving its objectives.
The company is anxious to increase the size of this team by the recruitment of

## Experienced Computer Development Staff

who are prepared to work at ST. ALBANS or BOURNVILLE, near Birmingham and who might be assigned for short periods to other locations.
The systems under development are to be run on large multi-programming machines with both disc and tape storage, an experience of this type of environment is essential.

## Systems Analyst

should have at least 3 years' experience including the design and implementation of at least one major system. Applicants having a degree or professional qualification will be preferred.

## Programmers

should have at least 2 years' commercial experience of programming for a disc and tape machine in both COBOL and an Assembler language.
SALARY should not prove a bar to applicants with the required experience.

Please apply in writing, giving full details of education, career to date and current salary to:
Mr. C. B. Beard,
Company Personnel Department,
CADBURY SCHWEPPES LIMITED,
Bournville,
Birmingham.
Please quote ref. No. B1/1644/D.

**Cadbury Schweppes**

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**LONDON BOROUGHS' JOINT COMPUTER COMMITTEE**

# COMPUTER OPERATORS (MALE)

required for large LEO III installation at Greenwich, S.E.10. Three-shift, 5-day rotating system to cover working week of 37½ hours. First-class conditions. Operators will be trained for System 4–70 tele-processing systems. **Salary, subject to experience, within Scale £1,010 to £1,435 per annum plus 15% shift allowance on basic pay.**

*Application forms from the Computer Manager, John Humphries House, Stockwell Street, Greenwich, S.E.10.*

---

# SHIFT LEADER

Due to expansion two vacancies have arisen in our operations department for shift leaders.

Currently we have a 360/25 with disks, and have a 360/40 on order.

Excellent salaries, and generous shift allowances are paid, together with good fringe benefits.

This is an opportunity to join a fast-growing company. Progress to programming is possible.

Preference given to candidates with 360 DOS or System 4 experience

*Write or phone* 01–628 5951

**J. H. Milne**
**Investment Accounting Services Limited**
**1–9 City Road, London EC1**

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# THE COMPUTER APPOINTMENTS REGISTER
## £850—£4500

**D.P. Managers—Systems Analysts—Programmers**

*More computer people get new jobs this way than by any other single method.* Enrol on the Computer Appointments Register. It costs you nothing but the stamp. We have commissions to find over 200 computer personnel. Age limits 18–45.
*If you are good at your job you don't need to look for a better one. Employers will get in touch with you. All you need do is attend the interviews and choose the best job.*

NAME .....

ADDRESS .....

.....

DATA PROCESSING MANAGERS ☐ SYSTEMS ANALYSTS/ DESIGNERS ☐ PROGRAMMERS ☐ OPERATORS ☐
Please tick your box

*Post to NEIL CRICHTON-MILLER, The Computer Appointment Register, Argyll House, 246 Regent Street, London W.1.* DW 25/3

We are engaged in the manufacture of components for the motor industry, and are the major supplier in our field. Our main factory is at Slough, Buckinghamshire, where we employ some 1,800 people.

We already have a highly developed E.D.P. installation with a high-loading factor, based on an ICL 1004 and an ICL 1902A computer with four discs, which was installed in December, 1969, to cater for a wider range of applications, including production and inventory control.

In addition to our present experienced and efficient team, we require:

# Experienced Programmers

We wish to expand our programming team, currently writing in COBOL. Successful applicants will have had at least 18 months' practical experience and a knowledge of PLAN and discs would be an added advantage.

The successful applicants will be joining an efficient and expanding company which places considerable emphasis on career development, and will be given every encouragement and opportunity to confirm the potential which this vacancy will offer.

The salary paid will be competitive, and interested applicants are invited to write or phone: The Staff Personnel Officer, Cooper's Mechanical Joints Limited, 14 Liverpool Road, Slough, Bucks. Tel. Slough 24511.

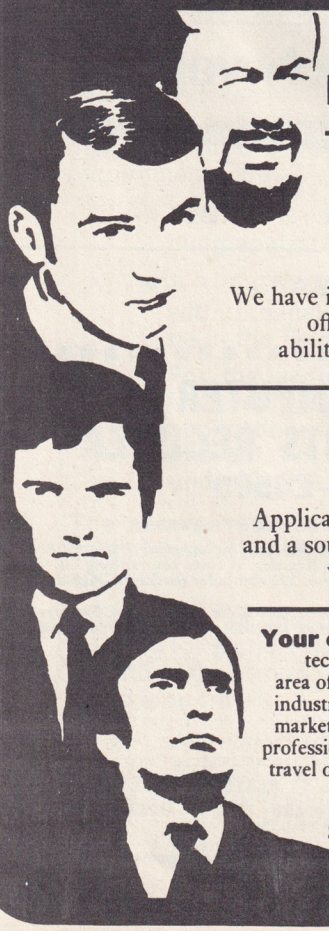
T&N

*Turner & Newall Limited*

# Shift leader 360

## (up to £1,800 per annum)

Required for a busy and expanding 360/30 Installation in the South London area.
Applicants for this position must have at least one year's operating experience on a 360 and a sound knowledge of D.O.S. Some experience of operating in a multi-programming environment would be desirable but is not essential.
This is a responsible and interesting position and offers considerable scope for career development in Data Processing.
If you are interested and would like to learn more, please write to **Box DW/2456 c/o Classified & Recruitment Services Ltd Pemberton House, 4/8a East Harding Street, London EC4.**



An opportunity in Scotland to join one of Europe's most dynamic business organisations

## Analyst/Programmers up to £2,500
## Programmers up to £2,000

We have important assignments based on our Edinburgh and Glasgow offices for men and women with a high standard of professional ability and substantial experience with 3rd generation equipment.

## Marketing Executives

starting salaries up to £3,000

Applications are invited from men with wide commercial experience and a sound knowledge of computer applications and techniques, and with the ability to introduce technical services at senior level.

**Your career in SPL** SPL International provides technical and management services in every major area of computer development – government, finance, industry, commerce, science, medicine. Technical and marketing abilities will find full scope in a stimulating professional environment, with generous rewards, wide travel opportunities, and outstanding career prospects.

SPL INTERNATIONAL

*Write or phone for application form*
SPL International, 9/11 York Place, Edinburgh EH1 3EB. Tel 031-556 1267
*or* Ingram House, 227 Ingram Street, Glasgow C1. Tel 041-248 6737

# COPY DATES

**for the April 8th issue of Dataweek are:**

✦

*Copy for Setting:*
**FRIDAY, April 3rd 4.30 p.m.**

✦

*Blocks and repro's:*
**MONDAY, April 6th BEFORE 10.30 p.m.**

**MSL** Management Consultants in Human Resources
17 Stratton Street London W1

## Computer Project Manager
also Project Leader
up to £4250

for the West Midlands based management services team of a major British engineering group with £275 million plus assets. The computer division provides an internal consultancy service to group companies. The Project Manager will be responsible for controlling assignments from initial feasibility studies to final implementation via detailed systems design and training of personnel. A Project Leader to take contributory responsibility is also to be appointed at a starting salary of up to £3,250. Advanced computer techniques are in operation throughout the group, and total investment in computer hardware exceeds £3m. Candidates for both appointments should be aged 27 to 40 with at least five years' D.P. experience. Successful implementation of at least one project is essential, and for the senior appointment, several years' management experience of systems and programming activity. Pension, life assurance and relocation help. E. I. Clark reference KF.1155.

☐ **The MSL Consultant has analysed this appointment**
Further information will be sent if you provide your name and address by telephoning 01-629 1844 or writing to the consultant quoting the reference. Your enquiry will be in confidence.

# PROGRAMMING LECTURER
## Ferranti Digital Systems

To support our expanding *PROGRAMMING* effort we need a LECTURER with some experience in assembly or higher level languages. If you like talking to people and are educated to degree standards we can offer you a rewarding position in a small self-contained teaching team. Access to our in-house computer installations, on a personal use basis, is readily available for planning and preparation as well as during training courses.

In addition to providing for customers' requirements we have to give initial training to newcomers to our own programming staff and then follow this up with a continuing programme of education in advanced techniques. This is a challenging opportunity which requires close involvement with our software people and our man (or woman) must be ready to take a keen interest not only in training, but also in the day to day work of the Programmers.

The Digital Systems Department is situated at Bracknell, Berkshire in the midst of some beautiful countryside, 30 miles from the centre of London. The company operate a contributory Pension and Dependents Assurance scheme.

Please write, quoting reference D/122/AP to:

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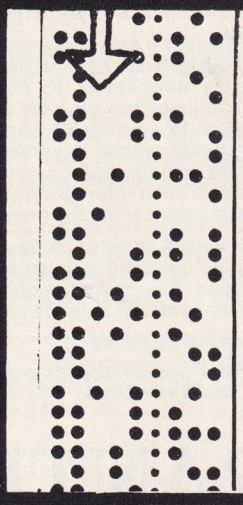

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